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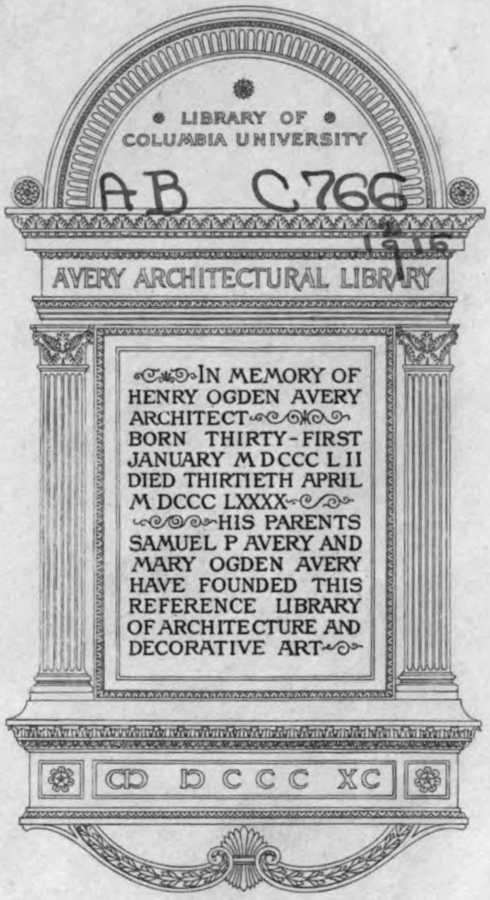

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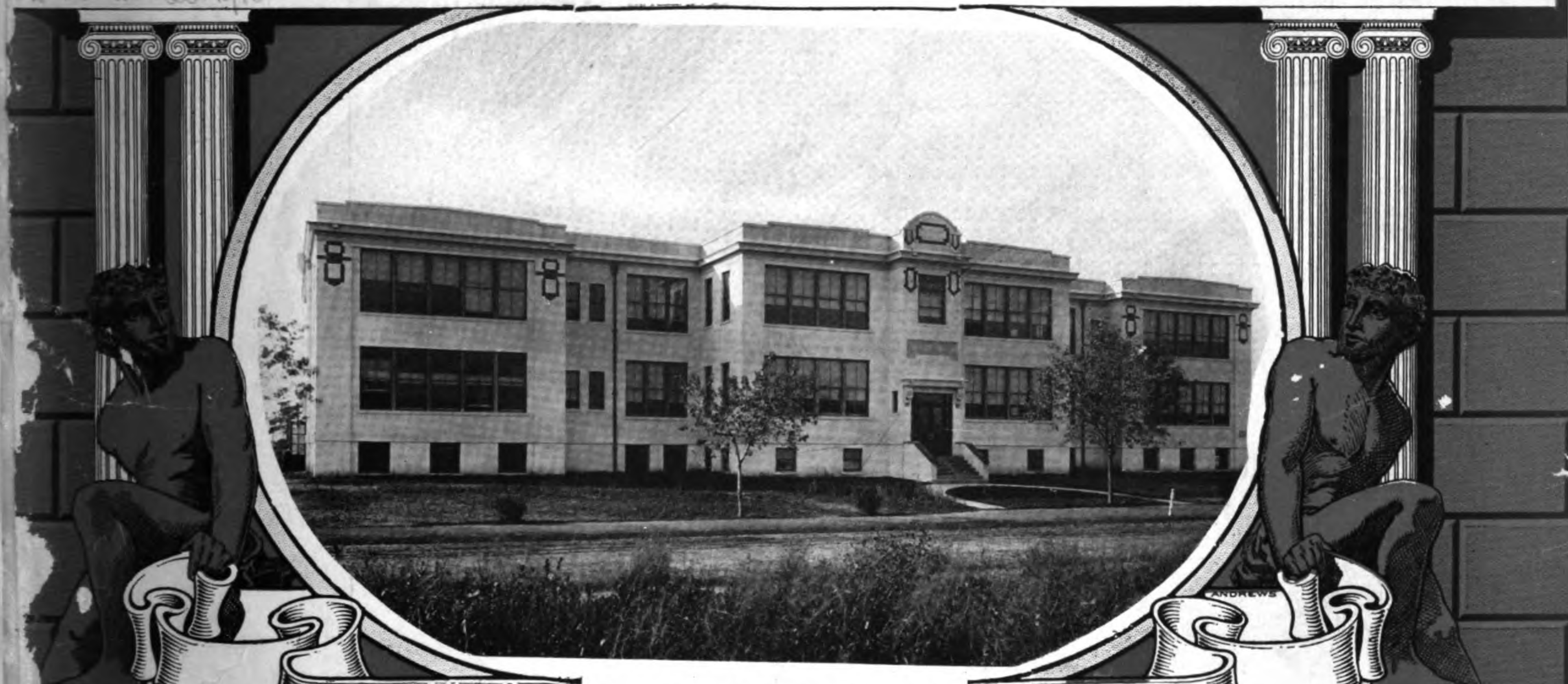

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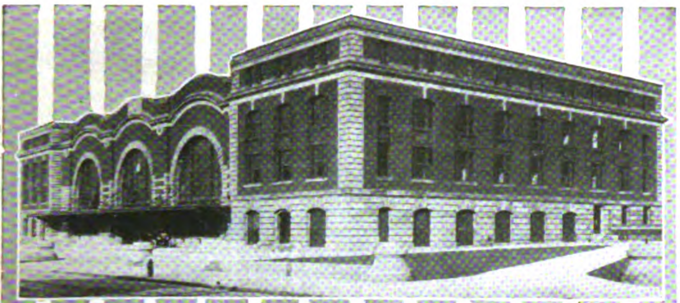

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WITH A
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A new department containing up-to-the-minute news of new devices and applications of materials—also news of the manufacturers.

Entered as second-class matter November 3, 1915, at the post office at New York, New York, under the Act of March 3, 1879.

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IF YOU ARE A MANUFACTURER OF FIRESAFE MATERIAL OR PROTECTIVE DEVICES

consistent presentation—in season and out—of your product in CONSTRVCTION cannot fail to result favorably because the success of this publication depends upon

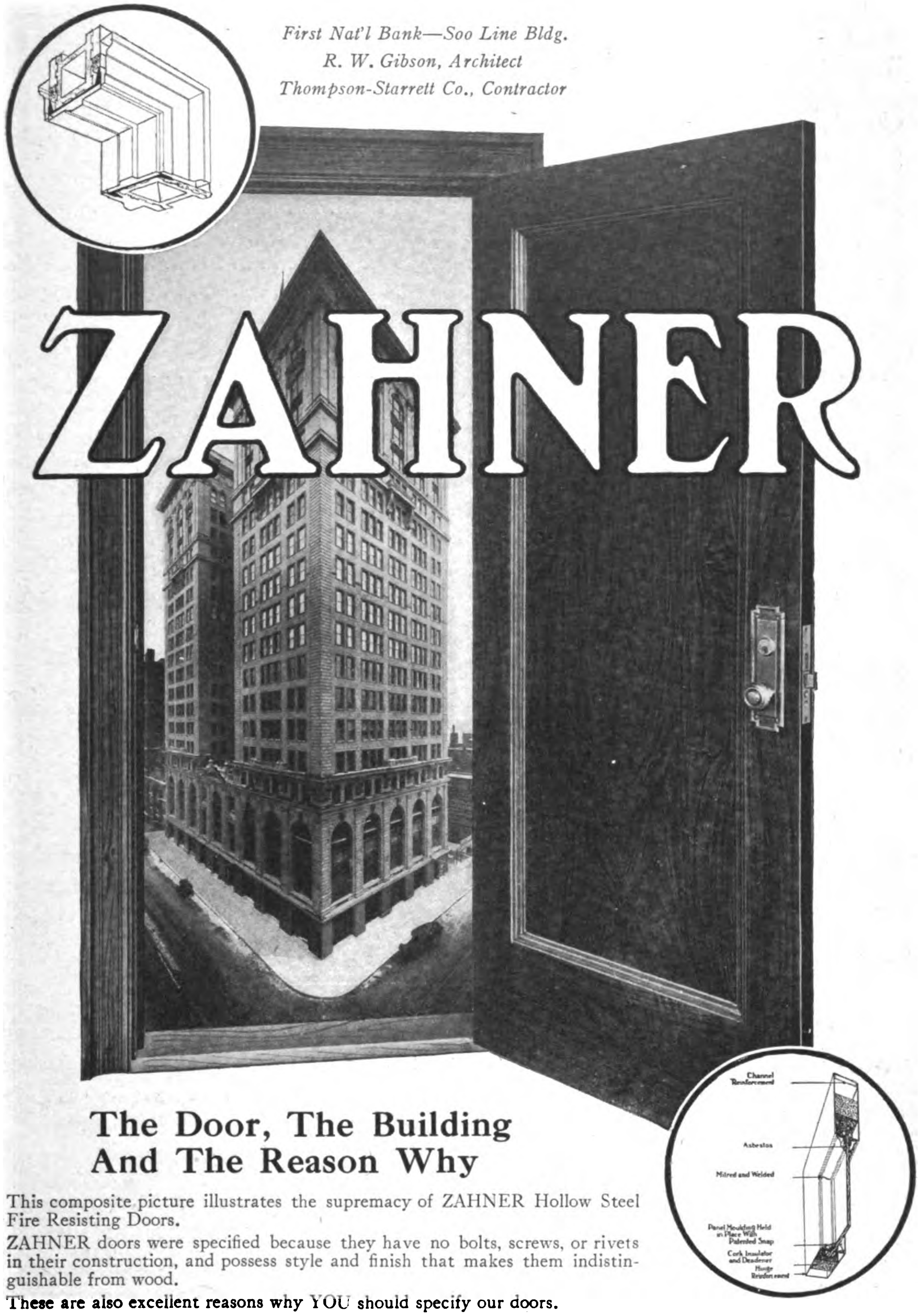
(1) how well it advances and proves the argument for proper fireproofing

and

(2) what it actually accomplishes to increase the use of firesafe materials and devices.

The first objective is attained (intensively) through the editorial, news and advertising sections of CONSTRVCTION and (extensively) by sending the magazine over the entire country to all the business and professional interests related to building planning, construction, equipment and maintenance.

The second purpose is accomplished by ***actively fighting for legislation favoring firesafe construction*** **and against laws permitting the continued use of wood——and remember that no company can do this work as effectively as a publication, that the "fireproofing fraternity" at present is a composite unorganized body comprising a number of separate units representing more than a dozen industries, that there is practical need of a national mouthpiece such as you have in CONSTRVCTION, that** ***makers of fireproof materials are now getting but one per cent of the business which ought to be theirs,*** **that advertising in CONSTRVCTION is helping yourself to get more orders, giving your goods the representation they deserve—and according this publi the co-operation it merits.**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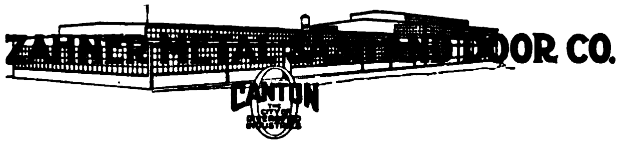
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THE CITY OF GREATER INDUSTRIES

THE ZAHNER METAL [illegible] DOOR CO.

New York Office
42nd Street Building

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Fireproofing Information Bureau

¶In establishing this complete reference service, manufacturers and others producing catalogs, house organs, price lists, etc., are requested to forward their printed matter and samples and place CONSTRVCTION on their permanent mailing lists.

¶The FIREPROOFING INFORMATION BUREAU is intended for the use of resident and visiting architects, engineers, contractors and the general business and professional firesafe building fraternity, as well as prospective building owners, to whom its use will be extended gratuitously.

¶Every effort will be made to develop and maintain this Bureau to a high point of efficiency.

¶Prompt coöperation is solicited.

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SHEET METAL FIRE DOOR

Equitable Building, New York
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Where Caution is a Religion

The fact that the best known hospitals and sanatoriums have selected Ambler Asbestos Shingles (Century Brand) for their roofs—is significant.

The FIRE hazard must be eliminated—not partially—but entirely. The roof must be weather tight for dampness, moisture and rain might have a serious effect upon the inmates—and the roof must be wind and repair proof for consequent noise and inconvenience of re-roofing could not be tolerated.

So—where caution is a watchword –you invariably find that the trustees have specified

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What applies to the hospital applies with equal force to the home—the church—the school—the industrial plant. Maintenance of buildings is an ever appearing burden. It can be reduced considerably if the correct roof is specified.

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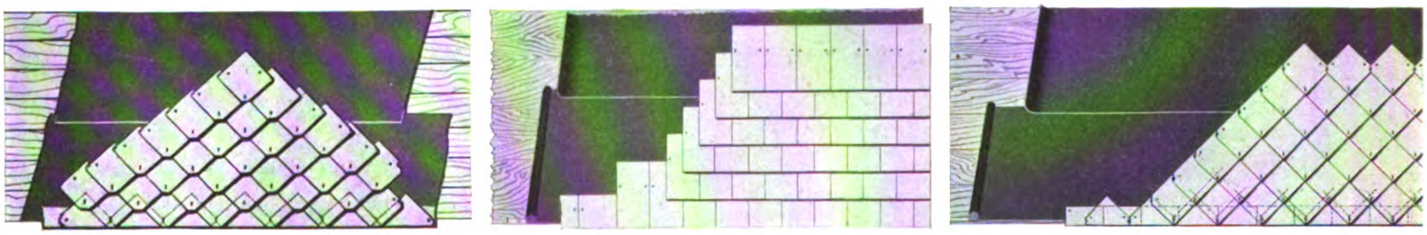

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CONSTRUCTION
WITH A DEPARTMENT DEVOTED TO
SAFE HOMES

VOL. II FEBRUARY, 1916 No. 2

Reducing the Fire Hazard in School Buildings

By C. Stanley Taylor

The burning of hundreds of school buildings annually, with the consequent loss of life and property, has been forced to the attention of the public, with the result that national interest in the subject of proper school-building construction and equipment and the improvement of existing conditions has been aroused. This article explains what is being done to better conditions in existing buildings and will be followed next month by a description of practical design and construction of new school buildings from the standpoint of safety against fire.

"At the Threshold of the House of Life they found Death"

BELIEVING that the necessity for immediate action in the matter of reducing fire losses in school buildings has become a fully recognized fact, no attempt will be made to discuss the recent losses of life and property in school fires which have appalled the nation—grim tragedies the full horror of which is never brought home to any of our people except the relatives and friends of the little children who have been suddenly taken away.

Realizing that hundreds of thousands of persons of all ages, eager to obtain education or forced by law to attend school, are spending a large part of their time in educational buildings which are absolutely unsafe from the standpoint of the fire menace, it would seem that a discussion of methods of investigating existing school buildings and rendering them less dangerous, and methods of enforcing proper and consistent firesafe construction of new buildings would prove timely and valuable.

In the matter of what is being done by legislative

BAY RIDGE HIGH SCHOOL, NEW YORK CITY C. B. J. Snyder, Architect

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bodies throughout the country little can be said except that the question of proper schoolhouse construction has been receiving considerable attention, and excellent progress has been made in such States as New Jersey, New York, Ohio, Massachusetts, Pennsylvania and Connecticut in the matter of investigation and law making. Other progressive States are taking up the matter, and it would seem that within a few years school buildings throughout the country must be of standard firesafe construction.

Investigation of Conditions

New Jersey's present school building code became operative three years ago, since which time all structures erected in the State have been in strict accord with its provisions.

All plans must be approved by the State architect, and the work passed upon by the State inspectors before local communities are allowed to accept buildings from the contractors.

Before the enactment of the existing law, communities were free to erect school buildings of any kind they saw fit, so long as local ordinances, where such existed, were not violated. Under these conditions, and in the absence of any special firesafe knowledge, it is not surprising to learn that many of the old-type buildings are little better than fire traps. In an intelligently directed effort to ascertain, and in so far as is possible eliminate the dangerous conditions inherent in the old-type structures, Commissioner of Education Kendall, under late date, addressed all boards of education throughout the State a letter and series of inquiries bearing upon the subject. Feeling that the inquiries might with advantage be used in other States, we reproduce them, together with their accompanying letter:

"The safeguarding of children in school buildings is of the greatest concern. Important as education is, it it not worth what it costs if this education involves physical danger to pupils and teachers in the buildings provided by the people of the school districts of the State. Owing to a recent fire in a school building in a neighboring State, in which a number of children lost their lives, the public mind is at present sensitive to fire hazards and panics in schoolhouses.

The school law is explicit and mandatory—that every school district shall provide suitable school facilities and accommodations; the law further provides that such facilities and accommodations shall include proper school buildings.

Should there exist in your district a building containing possible fire or panic hazards, you are not doing your duty as required by law until means of safe exit have been provided and the possible danger to the children from these hazards eliminated.

The responsibility for providing safe exits (safe under all foreseen conditions) is great. The erection of approved fire-escapes, fireproofing over and around boilers and heaters, etc., is comparatively inexpensive. You cannot afford to incur the criticism and censure of the public should an accident occur.

Boards of education have during the past few years made very commendable progress in the improvement of the buildings erected before the present Building Code (which provides adequate provisions for safe exits free from fire or smoke should a fire occur) became effective, especially in the matter of proper exits, fire-escapes and boiler or heater room fireproofing.

Our public school buildings, as a whole, were never so safe as at the present time; but any building under your charge, and for which you are directly responsible, which does not have the proper fire and smoke safeguards for the quick and safe exit of the pupils, should be closed until you have provided a safe building. A board of education does not hesitate to close a school on the appearance of a contagious disease among the pupils.

If you have a doubt concerning the existence of possible fire or panic hazards in a building under your charge, I urgently request that you at once either:

1. Appoint a committee consisting of: (a) The president of your board, (b) the chairman of the building committee, (c) the city superintendent or supervising principal, and (d) a competent builder or architect; *or*

2. Bring about the appointment of a commission consisting of: (a) one member of the board of education or a representative of the board, (b) the superintendent of schools or his representative, (c) the director of public safety or the chief of the fire department, (d) a well-known architect or builder of high standing, and (e) a prominent citizen, to be appointed by the mayor upon the request of the board of education.

This committee or commission would look carefully into any possible fire or panic hazards that may exist in the public schools of your city.

Knowing that you will take prompt action, I have prepared forms on which are indicated the various details of information necessary to determine the safety of exit and danger of fire in each building of two or more stories in height.

One of these forms should be handed to each principal of a two or more story building erected prior to 1913, and he should be asked to answer all questions with the exception of the last two, for the information of the committee or commission. The last two questions should be answered by the board of education itself through its officials, and in the light of the information it receives as a result of the personal inspection of the building by the committee or commission.

The clerk or secretary should make a copy of the completed report and send the original to the Department of Public Instruction, Business Division, Trenton.

It should be pointed out that neither the State Board of Education nor the Commissioner of Education has any jurisdiction over buildings occupied by private schools.

I will ask you to acknowledge receipt of this letter and report at the earliest practicable date what action you have taken.

This letter is written because of my responsibility as Commissioner of Education, having supervision under the law of all schools in the State receiving any part of the State appropriation, and also with a desire to co-operate with your board of education."

Name of school..................*No*......
School district of........................
County of..............................
Approximate date of erection..............
(In answering questions use lead pencil)

CONSTRUCTION

Number of stories in height ...... *(If basement ceiling is 7½ feet or more above the finished grade line it shold be counted as a story in determining the height of building.) Of what materials are the outside walls constructed?* .... (masonry or frame); *interior walls?* .... (fireproof or wood studding) *Of what materials are the class room floors?* .... (frame or fireproof); *corridor floors?* ...... (frame or fireproof) *Of what materials are the stairs constructed?* .... (wood or fireproof) *Are the walls surrounding the stairs of fireproof materials?* ...... *Of what materials are the ventilating flues and ducts constructed?* .... *Is the heating apparatus, including smoke pipe, enclosed within a room having fireproof walls and ceiling?* ....

OCCUPANCY

Number of pupils normally enrolled in the building ....

Basement:

Number of regular class rooms ....
Number of pupils normally enrolled in all these class rooms ....
Number of rooms used for other purposes than regular class rooms, such as gymnasiums, manual training, domestic science, laboratories, recitation rooms, etc ....
For what purpose is each of these rooms used?
(Briefly describe the means of exit from the basement.)

1st Floor:

Number of regular class rooms ....
Number of pupils normally enrolled in all these class rooms ....
Number of rooms used for other purposes than regular class rooms, such as gymnasiums, manual training, domestic science, laboratories, recitation rooms, etc ....
For what purpose is each of these rooms used?

2d Floor:

Number of regular class rooms ....
Number of pupils normally enrolled in all these class rooms ....
Number of rooms used for other purposes than regular class rooms, such as gymnasiums, manual training, domestic science, laboratories, recitation rooms, etc ....
For what purpose is each of these rooms used?

3d Floor:

Number of regular class rooms ....
Number of pupils normally enrolled in all these class rooms ....
Number of rooms used for other purposes than regular class rooms, such as gymnasiums, manual training, domestic science, laboratories, recitation rooms, etc ....
For what purpose is each of these rooms used?

4th Floor:

Number of regular class rooms ....
Number of pupils normally enrolled in all these class rooms ....
Number of rooms used for other purposes than regular class rooms, such as gymnasiums, manual training, domestic science, laboratories, recitation rooms, etc ....
For what purpose is each of these rooms used?

5th Floor:

Number of regular class rooms ....
Number of pupils normally enrolled in all these class rooms ....
Number of rooms used for other purposes than regular class rooms, such as gymnasiums, manual training, domestic science, laboratories, recitation rooms, etc ....
For what purpose is each of these rooms used?

If there is an auditorium or assembly room in the building, name the floor upon which it is located and give the normal seating capacity .... *How many exits from the auditorium?* .... *Briefly describe them* ....
....
....
....

EGRESS

How many continuous stairways in the building leading to the uppermost floor? .... *How many* *stairways used by pupils for exit to the street or grounds? .... Are the stairways well separated from each other or close together? .... Are stairs provided with handrails on each side? .... Are treads of stairways provided with safety treads? .... What are the widths of the various stairs? ...., ..., ..., ..., ... Width of tread? .... Height of risers? .... Are they constructed with winders? .... Have they intermediate landings where change in direction occurs? .... What is the width of landings? .... Are there any obstructions in the hallways, such as bicycles, boxes, etc? .... What provisions are made, if any, to prevent smoke from entering the stairways if a fire should occur? .... If smokeproof doors are provided, are they kept normally closed by springs or spring hinges? .... Are these doors equipped with hooks, stops wedges or any other device which will permit them to stand open? .... Are the exit doors equipped with anti-panic bars or bolts? .... Are doors bolted at top and bottom with ordinary bolts? .... Do the exit doors swing outwardly toward the natural exit? .... Are the doors leading from the class rooms to corridors and the outside exit doors provided with plate glass panels? ....*

Are fire-escapes provided on the outside of the building? .... How many? .... Are they approached from windows or from doors opening at the floor line? .... Do the doors open outwardly? .... Are they equipped with anti-panic bolts? .... How wide are the fire-escapes? .... What is the width of the tread on the fire-escapes? .... What is the height of the riser? .... Have they closed risers? .... Tight treads and platforms? .... What is the height of protective railing down the fire-escape and around platforms? .... Are handrails provided? .... Do the stairs lead direct to the ground or is the lower part movable? .... Have gates been placed at the foot of the fire escapes? .... How many steps in the longest flight? .... In the shortest flight? ....

FIRE PROTECTION

Are fire doors provided at the foot of the basement stairs? .... Are the windows which are crossed by fire-escapes glazed with wired glass? .... Are the doors from the heater room tin-clad and equipped with proper self-closing device? .... Is the building supplied with fire extinguishers? .... How many on each floor? .... Is the building equipped with fire hose? ....

FIRE DRILLS

How frequently are fire drills conducted? .... Are all the exits used in fire drills; viz. fire-escapes and all stairways, or fire-escapes only? .... What time is required to empty the building at fire drills? ...... minutes ...... seconds.

HAZARDS

Are there any closets or storerooms under stairs? .... Gas or electric meters? .... Is there a book-lift or elevator in the building? .... If so, is the shaft built of fireproof materials and the openings equipped with self-closing fireproof doors? ...... Are there dust or waste paper chutes in the building? .... If so, are they constructed of fireproof materials and provided with self-closing fireproof doors? .... How is the building heated? .... (steam, warm air, hot water) *Is the building ventilated by a mechanical system, by gravity or windows? .... What is the distance between the smoke pipe and the nearest woodwork? .... How frequently are ashes removed? .... Are they kept in metal cans .... What disposition is made of waste paper? .... How often .... Are shavings and chips removed from manual training rooms daily? .... Are the class room floors oiled to prevent dust from arising? .... When a signal is given for fire drills does the janitor stop the fans from running? .... Where are the floor oils and mops kept? .... Is the building wired for electric lights? .... If so, are the wires run in conduit, knobs and tubes, moulding (metal or wood) or open work? .... Is gas used for lighting or cooking? .... Are any of the fixtures of the swinging arm bracket type? ....*

GENERAL

Does your board consider this building, in view of the report, hazardous from a fire or panic standpoint? ....; and, in the judgment of the board, would the occupants be able to make a safe escape from all parts of the building by means of the present facilities in case a fire should occur in any part of the building? ....

Careful answers to the foregoing series of questions, made by officials of the various schools in the State who understand clearly the object in view, will simplify the matter of lessening the school fire hazard. After such data has been collected, a determination of the common hazards can be arrived at and first action taken toward their removal. These are commonly poor exit facilities, dangerous basement and storeroom conditions, hazardous occupancies in the form of cooking rooms, living quarters, workships and vocational class rooms, chemical laboratories, etc.; wooden structural members unprotected and too near heating pipes, and a variety of structural defects from the standpoint of safety against fire.

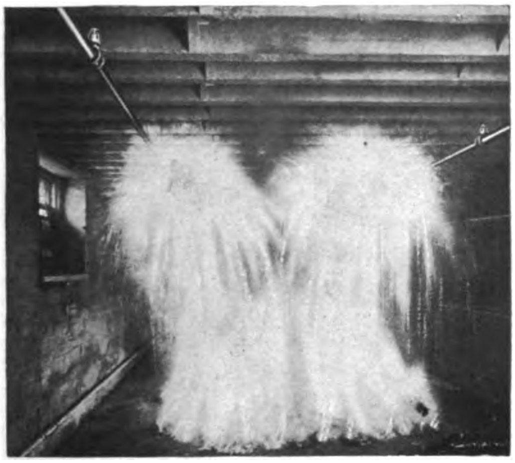
The next step is to enforce the correction of these conditions, which leads immediately to a discussion of automatic sprinklers. The installation of a sprinkler system is undoubtedly the first and best method of rendering fire-trap schools safe. The accompanying illustrations give graphical demonstration of this statement.

Automatic Sprinklers in Schools

"Automatic sprinklers fireproof combustible buildings," says the Industrial Commission of Wisconsin in the bulletin "Fire Protection in Schools." The bulletin calls attention to the things necessary to abolish fire perils in schools, and emphasizes automatic sprinkler protection.

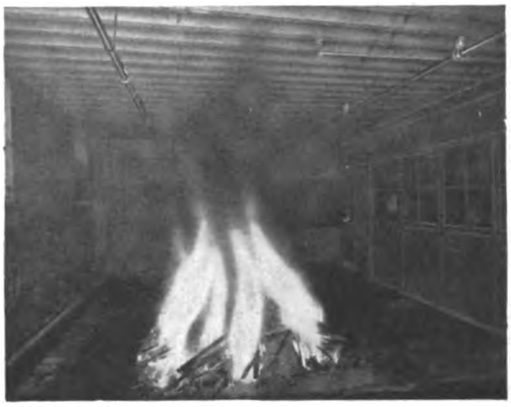
Under the heading of "Beware the Basement" two instances are related in the bulletin of schools completely burned by fire starting in basements. The bulletin says:

"Automatic sprinklers would have put them out. Water pipes, provided at intervals with sprinkler heads and connected with tank or public water main, should be installed in basements, under stairways and in supply rooms. Each sprinkler head is sealed with solder. Each head has fire alarm connection with janitor's office and local fire department. Heat from fire melts seal, releases valve, sounds alarm and drenches flames with water."


Of course the sprinklers opened when the fire had progressed far enough, as automatic sprinklers have been doing for more than thirty-two years in industrial and other kinds of properties, and then—

In the Wisconsin Industrial Commission's "General Orders on Existing Buildings," in effect September 20, 1915, following "Order 6307. Section 4 Standpipes and Fire Extinguishers—School Buildings, Libraries and Museums," is this note:

Automatic sprinklers (order 6030) are recommended for all parts of the basement where combustible material is liable to be stored. Basement sprinklers are especially recommended in three-story, non-fireproof schools.

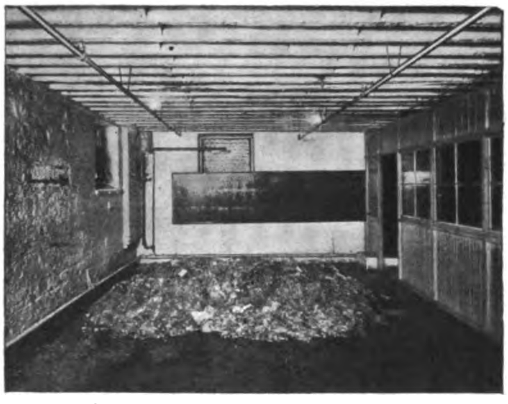

Soon after the fatal Collinwood School fire automatic sprinklers were installed in one of the old "built-to-burn" schools in Cleveland. To convince the skeptical a fire was kindled under the sprinklers in the basement—

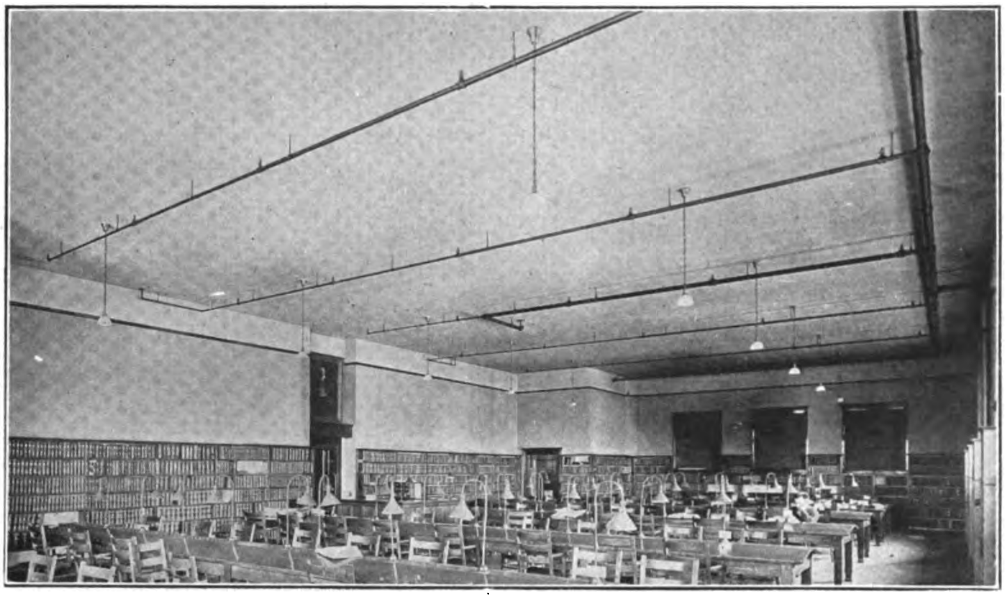
At the State-wide conference held in Faneuil Hall, Boston, Mass., November 9, 1915, to consider means of safeguarding from fire perils the children in the schools, automatic sprinkler protection received as much, if not more, attention as did other means of safety of life. Gorham Dana, manager, Underwriters' Bureau of New England and an international authority on sprinkler protection, told the gathering about the merits and technique of the automatic sprinkler. He said in part:

"The best means yet devised for preventing serious fires is an equipment of automatic sprinklers.

"An automatic sprinkler is a small brass water nozzle normally closed, but so arranged that when a temperature of 165 degrees is reached the soft solder which holds it closed will melt and release the necessary parts. It is entirely automatic in its action and does not depend upon any human agency to open a valve or to call the fire repartment. In this lies its greatest value. A half-inch stream of water is liberated and, striking a deflector, is distributed in all directions, so as to completely cover an area about 10 x 10 feet square.

"They are attached to pipes of the proper size fed by an adequate supply of water under suitable pres-


The sprinklers put the fire out, just as they have been doing for a third of a century, making factories, shops, etc., safer than schools. Who has ever heard of a fire-panic in a sprinklered building?



Automatic sprinklers installed in a college library.

sure. In most school houses a 4- or 6-inch connection to the nearest street main will give a proper water supply. In some cases tanks may be necessary.

"Sprinklers have now been used for over 40 years and have shown their value in thousands of fires. They have been so perfected that they almost never fail to work properly, provided only that they are properly installed and cared for. Proper care is a simple, though very vital, matter, and it should not be assumed that once an equipment is installed it can be neglected and forgotten and then be expected to do good work when the emergency arrives.

"The statistics of the National Fire Protection Association, covering a period of 19 years, show that out of 16,193 fires in buildings equipped with sprinklers 95 per cent were properly controlled. In the remaining 5 per cent the failures were due to preventable causes, such as closed valves, empty tanks, frozen pipes etc.

"The Committee on Safety to Life of the National Fire Protection Association reported in 1914: 'It is to-day an almost unquestioned fact that the automatic sprinkler affords the largest degree of protection of life against fires in practically all cases where there is combustible construction or material, the rapid burning of which is liable to be a menace to the lives of the occupants.'

"In school houses it is not usually considered necessary to equip the whole building. The important points to cover are: entire basement, the basement stairs, store rooms, closets and possibly corridors and laboratories. This is much less expensive than a complete equipment. The sprinklers are spaced 8 to 10 feet apart near the ceiling, so that no fire, no matter where it starts, will not be within the range of some sprinkler. The heat rising from the fire will fuse the solder in from one to three minutes, and the fire is extinguished in a large proportion of the cases before a second sprinkler operates.

"The little town of Manchester, Conn., has set an example that may well be followed by her larger neighbors. After a serious school fire about three years ago, her school houses were equipped with sprinklers from cellar to garret one by one until three grammar schools and one high school are now sprinklered.

"Buffalo and many other cities have taken similar action. Many of the large private schools and colleges have been equipped in whole or in part.

"There is no question but that automatic sprinklers, installed under the rules of the National Fire Protection Association, in the basement and lower stairways of a school, if kept in order, will prevent a fire from reaching such a size as would cause a panic. Such an equipment can be put in at a very moderate cost."

Unsafe Conditions Easily Corrected

During the week ended January 18 last, according to reports on file in the office of CONSTRVCTION, ten public school buildings throughout the country were burned, either wholly or in part, the property loss resulting therefrom aggregating $494,000. as follows:

Indiana, New Salem	$200,000
Kansas, Muscotah	7,500
Kentucky, Corbin	4,000
Louisiana, Colfax	12,000
Massachusetts, Chicopee	200,000
Montana, Lount	30,000
Pennsylvania, Altoona	500
Washington, Lake City	16,000
Washington, Peshastin	12,000
Wisconsin, Hales Corners	9,000

This is but one week in the year. The fact that schools are burning at the rate of at least one a day is not generally realized.

In existing buildings there are certain improvements which may be made at a comparatively low cost, and which will do much to decrease the fire hazard.

All unprotected wood lining under stair soffits should be covered with fireproof material.

Wood doors along the line of exit stairways should be replaced with doors of fireproof material.

All doors shall open into the stairway.

All stairways should be enclosed on each floor with fire- and smoke-proof partitions and doors.

All stairways should be not less than 3 feet wide (the standard is 4 feet).

Stairway terminals should be kept free of obstructions.

All doors opening on stairways should open on platform equal to width of door.

Outside fireproof stairways should be provided in buildings where present stairways are insufficient or inaccessible, and it is found to be impracticable to build an inside fireproof stairway.

The ceilings of all boiler rooms, cellars, basements and storage rooms, and all wood ceilings in existing buildings shall be fireproofed with a standard material.

The stairs and connecting passageways leading from cellar to first story or to play room, on or about the same level as the boiler rooms, shall be enclosed in fireproof partitions, at either end of which there shall be fitted a fireproof door, one of which shall be hung on spring hinges or operated with an automatic spring, the other to be a standard automatic fire-door, which, when open, shall be protected by a substantial steel enclosure.

Where areas exceeding 5,000 square feet exist the installation of fire-walls equipped with standard automatic fire-doors will do much to decrease the fire hazard, in that the rapid spread of flames will be checked by such a wall. Many fire-trap schools could be made much less dangerous in this manner.

Proper fire drills should be maintained and a dependable signaling and alarm system installed.

Every building should have at least two exits, remote from one another.

Exit signs should be provided, and shall be illuminated when building is used at night. Stairway and fire-escapes should be properly illuminated.

Fireproof storage rooms should be provided for furniture, books, lumber, paints, oils, paper, rags, etc. These rooms should be of fireproof floor, wall and ceiling construction, metal self-closing doors and metal window sash and frame, all glass to be wired glass.

Where steam or hot water pipes are within 2 inches of a wood member, proper protection should be supplied—the Collingwood fire started from the point of contact of a steam pipe and a wood joist.

Wood boxings or casing on steam pipes should be removed, and metal or asbestos covering substituted.

All schools should be completely equipped with approved fire extinguishers.

In Your Locality

The subject of the fire hazard in the schools located in *your* town or locality should be of primary importance.

There is undoubtedly a school near your home that is as poorly constructed as was the Collingwood school or the school that furnished the recent Peabody horror.

Your children may be exposed to the danger of fire, and only when a realization of this fact dawns in the minds of our citizens will they look into conditions in their own locality. It is the old story of the beam and the mote. We read of a horrible fire, in which many lives were lost, and pass on with the comment, "Such conditions should not be permitted to exist"—and our

FLUSHING HIGH SCHOOL, NEW YORK CITY — C. B. J. Snyder, Architect own children are forced to attend schools where structural conditions constantly threaten a similar fate.

Not only does the fire hazard exist in the grade and high-schools but in colleges and universities throughout the country. Within the past few weeks the chemical laboratories of two of our large universities have been destroyed by fire. Dormitories, libraries and lecture halls are often destroyed by fire.

The higher educational institutions should particularly interest themselves in this matter of fire prevention. Not only is there a lack of safety and consistency in the construction of the very buildings in which the future structural engineers of this country are educated, but they go out into the field of building construction without the slightest conception of what consistent fire-resistive construction is.

This naturally leads to a consideration of the safe construction of new school buildings. In the next issue of CONSTRVCTION this subject will be fully treated, covering the various types of construction and uses of materials and devices used in unburnable building.

Safe Construction of New School Buildings

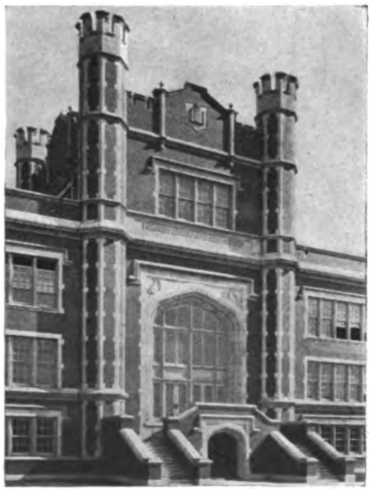
In discussing this very serious question one need make no apology for referring at once to the Collingwood fire. It was one of the most appalling and pathetic tragedies in the history of this country, and made doubly so by the fact that it was absolutely unnecessary. In spite of this fact, we are to-day building, or permitting to stand, in some sections of the country the type of structure that invites repetition of that terrible occurence.

Financial and political considerations, opposition to innovations and deplorable ignorance have all been factors in retarding fireproof construction as it pertains to public schools. In this matter we are even more responsible than the man who points the gun, for he may truthfully say that he "did not know it was loaded," whereas every school official possessed of sufficient intelligence to administer his office knows beyond all doubt or peradventure that a school house with open stairways, partitions, floors and roofs of timber or other combustible material is a constant menace to the life of every child that enters it, especially if it be of two or more stories. It is not negligence—it is *criminal* to build structures of this character. It matters not that their walls may be of masonry construction. With combustible interior construction they are as though a huge furnace had been erected to facilitate rather than to prevent the destruction of human life.

But the man who cannot see the pathos of sending a little child into such an environment, who is not possessed of sufficient imagination to thoroughly understand what might happen, or who, if he does comprehend the danger, takes a chance in order that a few dollars may be saved, is not by any means a rare and universally condemned monster. On the contrary, greed complacently sees thousands of toilers enter the death traps of our large cities day after day, and parents and school boards hope against hope, but sit supinely by when little children encounter the same risk. And the amazing part of it all is that some communities actually point with pride to buildings of this character, for, be it understood, the child-trap is not in most cases an old, worn-out and obsolete type of building. Too often it is conspicuously new and ornate and regarded as an evidence of progress and enlightenment. But no matter how beautiful its facade or proportions, no matter how costly its equipment or substantial its walls, if the interior construction is combustible it is a potential death trap just the same.

In the March issue
of CONSTRVCTION
will appear

The Firesafe Construction
of
School Buildings



The Editor's Page

IN the busy hours of every day
We pause—
To analyze and weigh
A striking word, or deed, or
thought.

Governmental Recognition of Real Fire Prevention

THE United States Geological Survey makes the statement that:

"The enormous waste due to fire may possibly be reduced—

1. By tests and investigations made to determine the relative fire-resistance of building material and the relative rates of heat conductivity of such materials and by the development of systems of construction which will offer the maximum resistance of fire. The tests should have in view the classification of building materials in the order of merit and the possibility of cheapening the cost of construction by using those best suited to the purpose, inasmuch as the cheaper materials are now often not employed through lack of knowledge of their availability.

2. By the dissemination of information regarding the more non-inflammable building materials, their strength and durability, the methods of utilizing them in construction, and the availability of the most suitable of these materials at places near the locality at which they are wanted."

Here the entire proposition has been clearly set forth by government experts after careful investigation. They realize the need of general education, particularly of the building public, along the lines of consistent fireproof construction.

A *realization* of the grave conditions in the building industry, which permit the enormous annual fire waste. is but a first step. The second *investigation* of methods of reducing this waste and the third and vital step is *action.*

The only feasible method of reducing the fire losses is by enforcing the consistent use of fireproofing materials and devices. Admittedly, prevention and not protection in the form of expensive fire-fighting equipment is the true and direct method of conservation of life and property.

The fire-loss total of 1915 has fallen off considerably from that of previous years, and this condition may well be taken as encouragement by those interested in fire prevention.

The admirable propaganda which is being carried on by such bodies at the National Fire Prevention Association, the American Society for Testing Materials, the American Museum of Safety, the Society Advocating Fire Elimination, must in time bear the fruit of a permanently reduced national fire waste.

A reduced national fire waste!

To the average mind this phrase means simply a few less millions of dollars' worth of property destroyed annually—a reduction of the popular annual fire-waste figure of $250,000,000. If every dollar of the actual value of burned property in the United States were multiplied by ten a closer estimate of the real annual fire waste would be made.

Consider for a moment a factory building destroyed by fire. Here is national wealth destroyed—an economic loss.

The owner receives insurance reimbursement for a portion of his loss—the people actually paid that insurance, the insurance company acting as a clearing-house. The factory hands are out of work—they lose. The factory is no longer a productive unit, nor does it absorb a share of raw material. The property is less taxable—the cost of fighting the fire was heavy —hence the community loses valuable records.

Then, too, there is the matter of loss of life. Here a factory or theater burns—there a school—and we are horrified by the appalling loss of the lives of helpless women and children. Investigations are ordered and made, but little good comes of them; interest dies out, *and we go on building our homes, our schools, our theaters and factories in a manner which renders them potential death scenes.*

We are not consistent in the matter of fire prevention. We express horror and sorrow when a great disaster occurs; but we do not act, principally because the full effects of the disaster are local and not sufficient to arouse the nation.

The time has come when the government which recognizes true fire prevention should take definite action in the matter of reducing the enormous waste due to fire.

There has been too much time wasted on protection —too much money spent in the maintenance of fire-fighting organizations. Let us begin *now* to *build right!*

Building *a* Building Code *and the* Value *of* Coöperation

By Rudolph P. Miller

Rudolph P. Miller, to whom great credit is due for his splendid work in successfully completing the new building code of New York City, has won just recognition in the field of structural and insurance engineering.

Among his many affiliations will be noted the following:

M. American Society of Civil Engineers.
Committee on Steel Columns

M. American Institute of Consulting Engineers.

M. American Society for Testing Materials.
Secretary—Committee on Fireproofing Materials
Committee on Hollow Building Tile
Committee on Gypsum Products

M. International Association for Testing Materials.

M. National Fire Protection Association.
President, New York Chapter

M. British Fire Prevention Association.

Chairman, Building Inspectors' Conference.

U. S. Bureau of Standards.
M. Committee on Reinforced Concrete
M. Committee on Testing Building Materials

SEVERAL attempts have been made, previous to this last one, to revise the building code of New York City. The old code was adopted in 1899. Some amendments were made to it from time to time, but no general revision had been undertaken until 1907, when a commission, of which I was a member, was appointed to write a revised building code for New York City. This commission made a report, but it was buried with the archives of the Board of Aldermen, which shortly afterwards went out of existence.

Since that time other attempts have been made, and in the course of the last ten years there have been, previous to the present code, thirteen different drafts submitted to the Board of Aldermen. One of these, which was known as the Majority Code, got as far as the Mayor, who, after giving a public hearing, vetoed the ordinance on certain specific grounds.

When this last Board of Aldermen (which serves for two years) undertook the revision, it started with a draft which had been reported out by the building committee of the previous Board, and in January, 1914, introduced what we at that time called the Hamilton Code, because of Alderman Hamilton, who was chairman, introduced into the Board. That, taken for a basis, was to serve for the revision work.

The building committee was more or less at sea as to how this was to be done. They finally called in the five superintendents of buildings of New York, one for each borough, and asked them, as a committee, to assist in the revision of this code. The building superintendents started it courageously, and changes were suggested in that particular draft, but it was soon discovered that with their other duties it was practically impossible for the superintendents to undertake a work of such magnitude.

The President of the Board of Aldermen then made the suggestion that instead of the building superintendents attempting this work, one of them, which happened to be myself, be retained by the building committee for the purpose of preparing the code.

At that time I felt, when they asked me how long it would take, that if my entire time were given to it it would take from three to five months. At the end of twenty months the Board of Aldermen adjourned *sine die* and a new Board has come in and passed several of the articles of that code, which is now practically fully adopted. So instead of taking five months it took about four times as long. It was a much bigger task than anybody had anticipated.

Why Previous Drafts Failed

One of the reasons for the failure of passage of previous codes was the fact that the building code is such a large document that when offered as a whole those who were expected to pass on it or those who were to consider it were at sea. They did not know how to tackle it—where to begin. There were so many phases —so many details to be made, not only correct but dovetailing one with another, and there was never time enough after the code was reported out to get a careful and thorough consideration of it before it was necessary to adopt it.

Then there was a difficulty that certain interests which were affected by the various provisions seriously opposed those provisions that were suggested, and that one bit of opposition held up the passage of the entire document. So, for instance, one of the documents that was offered was simply set aside, not because it had been thoroughly considered in all its parts and rejected, but because the residents of one of the outlying districts of the city felt that they were being deprived of certain rights by being included within the city fire limits. They felt they ought not to be so included, and because they felt so that document was made useless.

The Sectional Method of Codification

All this suggested the adoption of a method that perhaps might prove more successful; namely, not to propose the entire code at once, but to take it part by part. It happened that about the same time another committee of the Board of Aldermen, the Committee on Codification of Ordinances, was well on its way along its work in codifying all the city ordinances, and in doing so the entire code of ordinances was divided into chapters. Each chapter again was divided into articles, each article into sections, and each section into sub-divisions, and if further division was necessary these sub-divisions were divided into paragraphs.

Having a systematic plan laid out, the first step in the revision of our building code was to decide how many of the articles we wanted in our particular chapter—Chapter 5, which constitutes the building code—what subjects each article should deal with and then to group the sections under those articles. The old code was taken by the Codification Committee in this manner and divided into articles. Each of those articles was then taken up one at a time, not necessarily in the order in which they appeared in the chapter, each article being considered by itself.

The article which dealt with the new fire limits was adopted. First the fire limits were disposed of, and, having them to consider by themselves, whatever thoughts or suggestions or criticisms were made on it did not in any way jeopardize other provisions of the code.

Then followed the article dealing with plumbing. I merely mention them in order to illustrate, as the particular order is unimportant. That was dealt with by itself, and in dealing with that article, not only in the passing of it but in the revision of it, the actual work on the revision, the public hearings which were held and the final passage, only those particular topics covered by that article had to be considered.

It was my duty, as the engineer of the committee, to see that whatever was incorporated in that article properly fitted with what still remained of the old building code and with what had been passed of the revised code. In consideration of each of these articles, a method was followed which I think was largely responsible for the success of the entire work. Namely this: I always felt that a building code should not—nor any law, as a matter of fact—represent the ideas of any group of individuals, and certainly not the ideas of a single individual. While the superintendents of buildings were all men qualified to pass on this, yet their joint work should not be the law of the city.

The building official for one thing is inclined always to take a severer view, probably, than the law intended. The tendency among them is always to get ahead of present-day practice, or rather, in some respects, to get toward a safer construction. On the other hand, there is always a prejudice against the use and introduction of new materials, so that they see it from one angle only. The official sees it from the point of the man who has to endorse the law, and in feeling that responsibility he always wants to be on the safe side. He wants to get the best, not what is fairly safe, but he is trying to get the *best*. That is the wrong attitude, but that tendency undoutedly exists, and for this reason building officials alone are not in my judgment qualified to make building laws. Nor is a group of architects or a group of builders a competent body to write the building law, taken by themselves. One of the drafts that was spoken of as having been introduced in the Board of Aldermen was prepared by a joint committee of architects and builders. When it came up for public discussion it was severely criticised in many respects, until the joint committee finally took the attitude, "Why, this was merely suggested. Of course your building committee is the one who must finally pass on it!" But they seriously intended that what they had offered should be the law.

The Broader View-point

Knowing these things, or realizing them, I naturally felt that the way to do was to get all the judgment we could possibly get on what should be the building law, and one of the first things that committee did was to send out an invitation as widely as possible asking all those who had any suggestions to make to send them in for consideration. At the same time all the criticisms I could find on all the previous drafts were gathered together. The copies of all the previous drafts, together with the criticisms, were classified, with the result that I had before me what might be said to be the judgment of all interests on the particular topics under consideration. Using these as a basis, and taking into consideration the old law, I framed up what I called a preliminary draft of each article. These I sent out broadcast to all who were interested. Our mailing list, I think, consisted of something like two hundred and fifty people, who each received copies of these preliminary drafts as they were prepared.

In addition, we utilized the public press as far as they would let us to make known to the public what was intended in that particular article. So, for instance, when we were discussing the article on masonry construction a resumé of the proposed revision was made and sent out to all the newspapers, and that brought in additional criticisms and suggestions.

A day was set in connection with the preliminary draft up to which all criticisms should be returned. In that way we got the criticisms of those who were directly interested and we eliminated the criticisms and influences of those who had no right to talk on the subject.

In these preliminary discussions we always obtained the opinions of those who had a right to talk on the subject. Having gathered those criticisms, they were again aranged and a meeting of the superintendents of buildings was called, and they, together with myself, prepared a draft for introduction into the Board of Aldermen. That was introduced by the chairman of the committee as the committee's report on that particular article.

A date was then set for a public hearing, generally about two weeks later, and that draft, as it was reported to the board, was sent to the same people to whom the preliminary draft had been sent, and they were notified of the date of the public hearing. As a general thing those who had anything further to say always sent in their criticisms before the public hearing, so that by the time the public hearing came I was very well informed as to what the opposition, if any, would be or what would be said, and I could almost foretell with certainty just what the public hearing was going to develop.

At the public hearing everybody who was interested came and expressed themselves freely. I am glad to say that some of them had sufficient confidence in the committee and myself to assume that, having written their criticisms, they would receive the same consideration as if they appeared at the public hearing, though I always preferred to have these people at the public hearing, in order that their points might be addressed directly to the building committee. Building committees are not always considered as the best judges of what building laws should be, but I will say this for the building committee with which I worked—they all showed a keen interest in the matter before them and they were just as alive to the questions that were brought up as anybody could be.

After this public hearing the committee went into executive session and we discussed everything that had been brought out at the public hearing, and the committee directed what changes should be made in the draft that had been under discussion. That was reported out, with the recommendation for its adoption, to the Board of Aldermen. Under the rules of the Board, an ordinance of that kind had to lie over a week before it could be finally considered and adopted.

Even then the criticism did not necessarily stop. Sometimes matters developed on the floor of the Board of Aldermen which necessitated referring the matter back to the committee, or else laying it over for another week or so for future consideration.

However we managed in that way to have all the articles, one by one, adopted until we had a complete revision of our building code. It is not the work of one man, for there were at least two hundred and fifty advisors, all of whom contributed more or less to this revision of the building code.

The Value of Manufacturers' Organizations

Not the least among those who assisted in the preparation of the code were organizations representing particular industries. I feel that that is one of the things that an organization of this kind can do and should do. Any organization that represents a material that isn't worth while can't exist. If you have a good material it is bound to come in time, but there is a great deal of prejudice to overcome. There is a natural prejudice against all new materials. Builders, architects and, as has been said before, building officials especially, are hesitant about the adoption of new materials or the use of materials to which they haven't been previously accustomed. So an organization of the manufacturers of this material can, by gathering information as to that product and presenting it to the public in the proper way, exercise a proper and beneficial influence, not only on themselves but on the public at large.

If there is a new and good building material, the public ought to have the benefit of it. The public, as I said before, is naturally prejudiced against new materials, so that it becomes necessary for some one to bring forward the value and the need of a new material. When I speak of new materials. I include any material that is not already in general use.

Now there is a good deal to be done in the way of convincing, not only the public but the building officials, that new materials, or the material that is represented by any organiation of this kind, is a suitable and proper material to use. In doing so, an organization of manufacturers should not make any undue claims for the material. If it is a good material it will have its field. There will be a place where it can be used where other material does not serve the purpose as well. The organization should find out what that field is and inform the public and follow along lines of investigation to find out where its field is, how it can extend its field and always keep within that one limitation that it won't do to claim too much for the material. That is detrimental to the material, particularly when you are trying to convince building officials or building committees.

There are always people ready to criticise any claims that are made, and if they have the slightest hold on the material and can show that the material will not do what is claimed for it in any one particular, no matter how effective the arguments in other respects may be, that one particular thing will tend to militate against that material. I am speaking in this connection from experience with things that have been presented.

Certain materials have been presented before the building committee for recognition and have been rejected because of the lack of co-ordinated effort on the part of manufacturers to prove their claims

Perhaps it may be said, "Well, the individual members or the individual manufacturers can accomplish that just as well." I don't think so. In fact, my experience in connection with the revision of this building code leads me to believe that it is not so. We had an experience, for instance, in connection with the article on elevators. For years past an attempt has been made to get through our State Legislature, and later, also, in the building code, a requirement that all elevators should be equipped with a device that would prevent the car from leaving a landing until the shaftdoor was closed and secured against reopening. That suggestion met with decided opposition from many interests. Personally, I was opposed to it years ago, when I first came in as superintendent of buildings in 1910.

The matter came before me as a matter of proposed legislation in the State Legislature. I hadn't, I must say, given the question much thought, and the objectionable features of the bill appealed to me very strongly. I wrote to the Legislature in my official capacity that it was not a desirable bill to pass, and in that I was evidently following the general feeling. The organization of builders and architects and others were all opposing that legislation, and they were all reciting the objectionable features. The matter came up the next year and again I opposed it. But it occurred to me that this blind opposition was not fair, so I utilized the facilities I had at my disposal in the building department where we had the inspection of elevators in the city. I had an investigation made of the accidents on elevators. One of the claims that had been made in the State Legislature was that two hundred and fifty accidents in five years were due to the lack of such a safety device.

I asked for a list of those accidents and got it, and I investigated each accident individually until I found out that only about fifty per cent of those two hundred and fifty had any right to be considered. While I believe there was no intention on the part of those who were interested in that legislation to mislead, they claimed more than they could justify.

An analysis of the accidents convinced me, however, that fully eighty-five per cent of the fatal accidents on elevators could be prevented by the use of such a device. That meant a saving of about nineteen lives a year. With that information at hand I felt that as an official I had no longer any right to oppose any such legislation. I felt it was worth while saving nineteen lives a year, although according to my estimate it would take about two million dollars in this city for the necessary devices. I felt that it resolved itself into this: Are we justified in asking the public to spend two million dollars to save nineteen lives a year? Many people would take the view that it isn't worth it; that economically it isn't a fair proposition, but that was a question for the legislators to decide.

Antagonism vs. Co-operation

That was presented, but the point I am trying to make is this: With all that information at hand and wtih all these repeated attempts at getting this legislation passed, the people who were directly interested in the manufacture of these devices were so far apart as individuals that their influence was detrimental to the legislation rather than in favor of it. The man with the electrical device said the electrical device was the only one to be used and the mechanical one was no good. The man with the mechanical one took the opposite stand, and between the two you can see the effect on the building committee. If those people who were all interested in having devices of that kind put on the elevators had said, "This is desirable legislation. We must convince the building committee that it is desirable legislation and that it is for the interests of the public at large that it must be passed," I think they would have accomplished something. But they themselves did as much to defeat the passage of that particular provision as any other opposition.

This is mentioned merely to show what co-operation will do. There must be co-operation; that, is, there must be eliminated by this co-operation what might be termed antagonism between the manufacturers as individuals when they are desirous of enlarging the national market for their product. The co-operation that will be effective is to at least show the public and convince the Legislature that this is a material which deserves recognition.

Tangible Results of Manufacturers' Co-operation

Another illustration that will show how co-operation is of benefit to any industry was shown in the effort some years ago to have sand-lime brick recognized in New York City. As long as the individuals came in asking approval and permission to use sand-lime brick through the city there was nothing done. It took one live man, who got them all together and said: "We must convince these people that we have a material that is right and proper," and after considerable hard work and making the tests necessary to demonstrate the safety of the material, he finally received from the building department an acceptance of the material. The conditions under which the material would be accepted and could be used were finally drafted and laid down, and everybody who had sand-lime brick to offer in the city knew that all they had to do was show that their material was up to that standard and it could be used without further provisions.

Metal Lath Standardized

Still another illustration in connection with the revision of the building code was the efforts of the metal lath industry to get metal lath recognized properly. Up to a few years ago there was nothing in our building rules with respect to metal lath, and the different manufacturers in the metal lath industry were simply fighting one another. Each one, in order to get his material sold, was recommending to his customers that he might use a little lighter lath than he had been heretofore using, and that thing continued until we got such material in use which was unsafe.

By getting together, and in this case not only the metal lath manufacturers but also the journeymen got together, a decision was reached as to what was a proper standard of metal lath construction. Having gotten together on that, it was an easy matter then to convince the building officials that that was what should be accepted and should be considered standard, and that standard is now generally recognized. The material is not getting a black eye from the builders and owners because what has been adopted as standard is the minimum. Now it is for the individuals to get back of the users and convince them that this metal is a better one for his particular purpose than that other one. That is legitimate competition.

Seeking Proper Information

The point I wish to make is the usefulness of organized efforts, and particularly in its effect on building officials and building legislation. It is very desirable that it should be so. The building official, if he is a broadminded and fair man, is looking for that very thing, and he wants to be able to find some particular place where he can get trustworthy and reliable information. He ought to be able to go to an organization that represents the industry, and one that is representing the industry fairly and properly; otherwise he goes to independent investigators, who are always more or less on the safe side, and who are always more or less prejudiced against materials, and he doesn't get the practical knowledge that is needed. The manufacturer, of course, must know the material from its practical side or he cannot make a success of his material, and there is where the building official ought to be able to go to get reliable information.

* * *

The Greatest Factor in Trade Extension is Co-operation

Efficient Planning of Bank Buildings

By W. J. Hoggson
President
Hoggson Brothers
Contracting Designers

HOW to plan and build a bank so as to insure the greatest economy in its work involves first, a knowledge of its methods for handling its routine work.

With this information the floor space of a banking room may be so laid out as to give external expression to its methods, not only of handling its customers, but of handling its bank operations.

As an individual with however many capabilities must be trained along specific lines to obtain from his endeavors the full benefit for himself and those with whom he is associated, so the management of a business must have their surroundings so arranged that the direction of their work shall be facilitated in every way possible. In each of these instances the requirements must be secured with regard to that particular task, and the choice should fall upon that plan only which will perform the task with the least ultimate expense.

Numberless are the men who have destroyed all hope of success through never learning their own ability; and many are the business failures that have resulted from the management failing to see vital points as they appear to the public.

In the circumstances of the business management the chief end is their organization. This must be so perfect in control and so positively defined that the work of each person as well as department may cause no delay in the division and allotment of labor. With such an organization every part of it may be employed to complete the routine work, just as the individual makes his choice of study to the end of acquiring his technical training.

Few are the branches of mercantile life in which the management is more clearly suggested through its outward appearances than that of banking. The cause for this is evident; the bank of to-day is designed for the definite purpose of supporting the organization of that especial bank in the performance of its duties. The defined work of each bank must govern its organization and the routine of its business, and all this must

INTERIOR OF THE NEW HAVEN BANK BUILDING, NEW HAVEN, CONN.

SECOND NATIONAL BANK BUILDING, NEW HAVEN, CONN. A SUCCESSFUL BANK AND OFFICE BUILDING ERECTED UNDER THE HOGGSON BUILDING METHOD

influence the arrangement of its departments. For this reason the designing of a bank room must receive very thorough and competent consideration in the division of its spaces, the use of its light, the location of its entrances.

In the beginning, the arranging of a bank floor should be determined through an entire knowledge of how that particular bank deems it best to conduct its business.

What are its purposes in regard to meeting its patrons? Are the officials personally acquainted with them and do they believe their business interests will be advanced through direct contact? In this case the president and other officers wish to be near the entrance and only separated from the space given to their customers by a railing or low partition. Possibly the acquaintance of the president is limited or his customers so many that he prefers to have his office in a more secluded corner. Again, it may be the wish of a bank official to be so situated that he may see those entering the institution without any desire to personally speak with them. Here a glass partition would be required, giving the official opportunity to keep watch on the employees who come in contact with the public, without the annoyance of undesirable interruption. It is readily discerned that on the deciding of these questions rests not only the floor plan of the room but the furnishings to be used.

After the officials of the bank have been placed in the most strategic point for the performance of their several duties, the arrangement of the space devoted to the clerks must be decided. First among these comes the employees who deal with the patrons. Here another division may be made; the tellers receive by far the greatest number of the customers, and their location for this reason will probably receive first consideration. This scheme of division may be carried through the entire list of clerks who meet the patrons. During the arrangements, however, there must be considered the number of clerks to be accommodated and the number of accounts to be handled. The rate of growth in the past may be used as a comparative estimate of the growth in the future, and this should influence the arrangement, so as to eliminate as many changes as possible. The equipment which must be at the disposal of these clerks should have due consideration. These are desks, filing cabinets, book shelves, tables and various mechanical devices for which provisions must be made. The various departments in which these clerks are installed

INTERIOR OF THE NEW HAVEN BANK BUILDING, NEW HAVEN, CONN., SHOWING PUBLIC SPACE FLANKED BY OFFICERS' QUARTERS

are then arranged to handle the routine of the bank's business, so as to avoid all possible confusion and delay. This means that in so far as possible the operations should come in direct rotation.

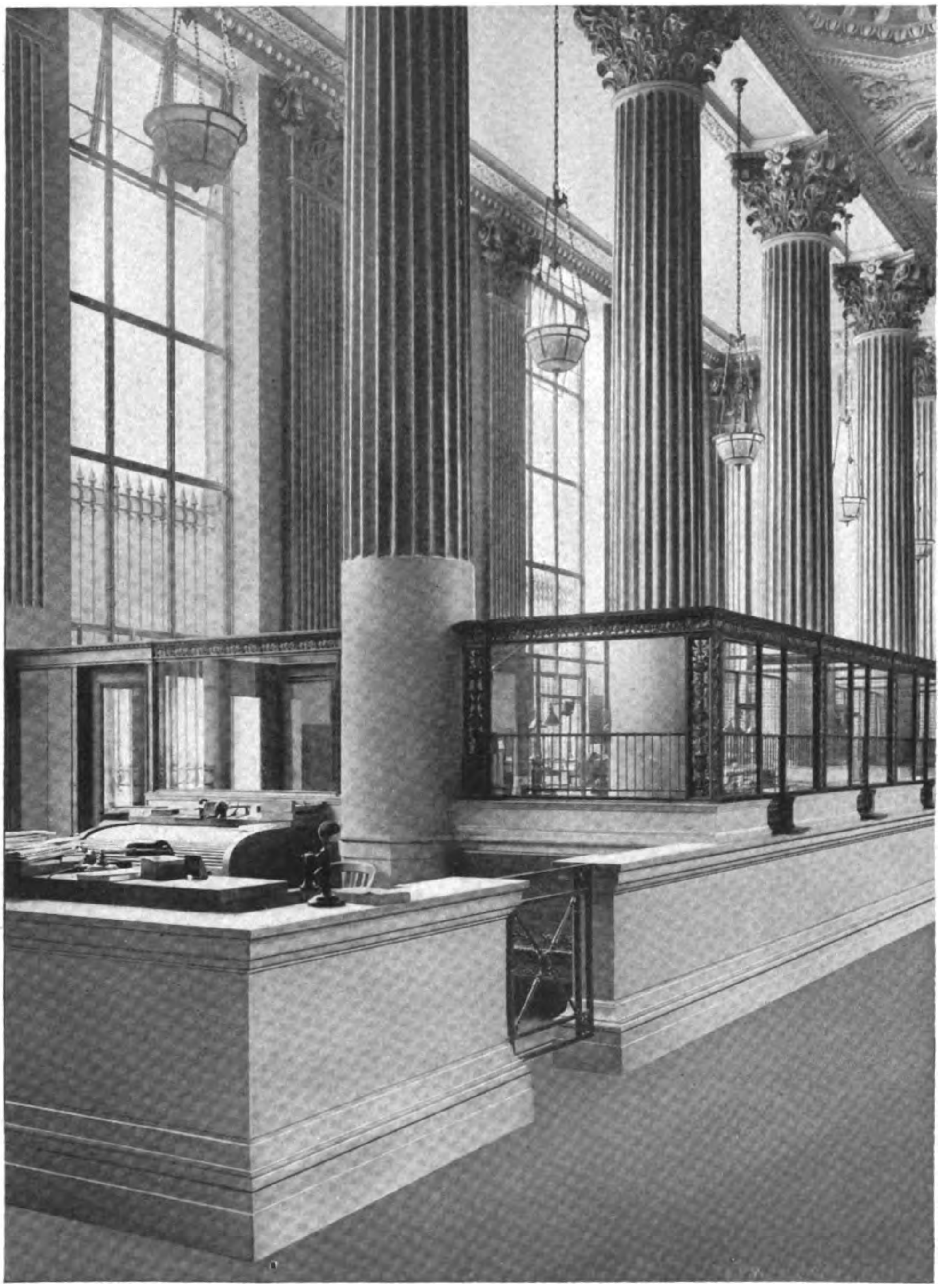
Following these considerations come the number and size of the safety deposit vaults. Protection is of the greatest importance here and must dominate all other considerations; yet this has to be accomplished while leaving them accessible either to the bank officials or to the customers—or both.

In no institution is the arrangement of light more important than in a bank. This one consideration will often affect the entire arrangement of a banking floor. It is a question of whether the bank can best be served by giving the light to the customers or the clerks, and the answer to this decides the arrangement of the furnishing—from the location of the president's office to the situation of the vault. Artificial light will sometimes equalize the situation, but it is never so desirable or penetrating as normal daylight. Oftentimes the light that will aid the clerks at their desks will also benefit the tellers in recognizing their customers, even though the main lobby of the bank is not so well lighted. This comes from the fact that the light coming from behind the teller shines on the face of the customer at the window. A prominent western bank once arranged its office in the interest of the patrons rather than the clerical force. The result was that the clerks facing the windows made so many errors in identification that the entire banking floor had to be remodelled. This mistake can often be overcome through a proper regulation of the light, but in that way the benefit derived from the daylight is often reduced very considerably.

FIRST-BRIDGEPORT NATIONAL BANK, BRIDGEPORT, CONN. A BANK AND OFFICE BUILDING OF UNUSUAL GRACE AND DIGNITY OF DESIGN

From the decison of these various questions and the conditions regulating them, the floor plans are drawn. The drawings now go into the elevation and the furnishings and fixtures are indicated. The question of the kind of partitions to be used arises; shall they be metal or glass, and if glass, transparent or ground? The question of heights is also to be decided. Will a seven- or eight-foot partition serve the purpose or shall they go to the ceiling? As to the desks, they must depend on the size of the books they are to hold, and the number that must be used at one time. The time-saving, mechanical devices in use in banks to-day have also to be reckoned with; sometimes they go on desks, sometimes on furniture manufactured for their particular use. These devices often require considerable space in which to operate them. Not long ago all the desks of a New England bank had to be made over in order to accommodate the ink wells. These had not been considered worthy of consideration when the desks were planned.

The room devoted to the use of the board of directors does not require the care in locating that do the spaces used by the operative force of the bank. Seclusion and quiet is the chief requirement. This room may be situated on the banking floor or, if the bank occupies a building, it may be placed on some other floor, entirely removed from the active work of the bank. In the latter instance it may be used without the knowledge of the bank force or patrons.



MAIN BANKING ROOM OF THE FIRST-BRIDGEPORT NATIONAL BANK, BRIDGEPORT, CONN. A WELL LIGHTED AND UNUSUALLY HANDSOME INTERIOR

A point to be considered in the furnishing of a bank room, and one of no mean importance, is the class of customers to be served. In the fashionable parts of large cities, banks often have luxuriously appointed ladies' rooms, while the downtown banks are designed to produce speed in the completion of all work, both in dealing with the customers and in keeping the clerical work up to date.

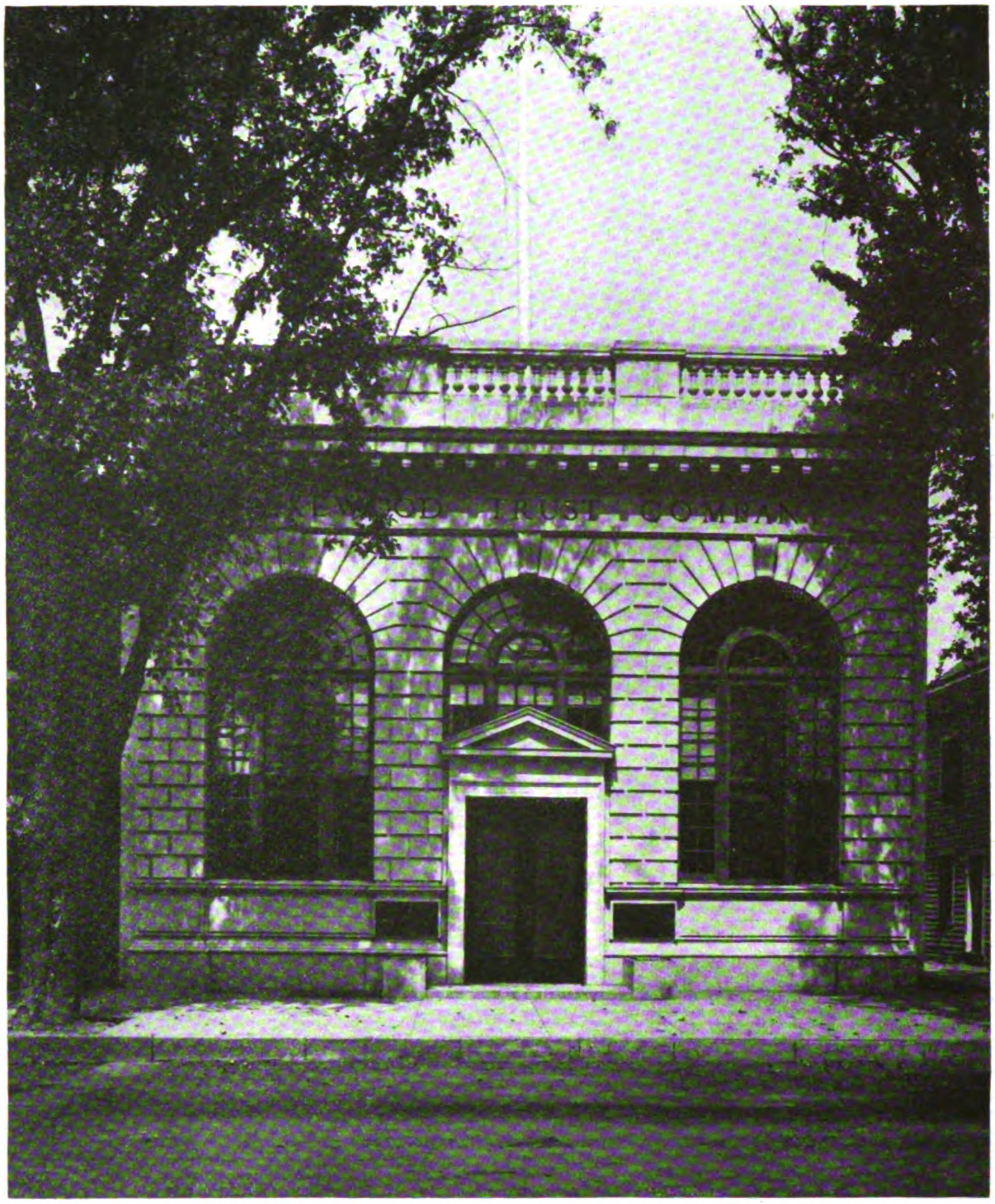
The question of cost should ever be kept in mind, though that need not materially limit the arrangement. It is more a matter of kind and quality of furnishing, and this must be determined to the last small fixture, to the style of cage locks, to the material of the handles on the cabinets.

As to whether the

bank building should be an individual one, erected for the exclusive occupancy of the bank, or one from which revenue can be obtained is always a matter of divided opinion, and is generally determined by the amount of the appropriation and the site of the new building. The advantages of both types are about equal.

That the exclusive bank building has a dignity and individuality which adds materially to the prestige of the bank cannot be denied. Its very aspect lends confidence, it is the concrete expression of the trust features of the banking business, it seems to express a conscious power and capacity for caring for its own responsibilities, and as a rule the architecture of an individual structure can be made more impressive than that of the large office building.

It is from the investment standpoint, however, that the combination bank and office building proves most attractive. The advantage of a high-priced, prominent corner lot upon which to build a bank is generally appreciated. The cost, however, frequently places a fixed charge on it for ground rent which practically precludes an individual bank building, owing to the excessive rental that would be necessary, while an office building properly executed will pay a splendid return on the investment and relieve the bank of the prohibitive rental that would be called for by an individual structure.



LAKEWOOD TRUST COMPANY, LAKEWOOD, NEW JERSEY. DESIGNED AND EXECUTED UNDER THE HOGGSON BUILDING METHOD

This is particularly true in medium-sized cities. Here ground values have not become so high as to make the relation between the value of site and the cost of the structure disproportionate. No office building, where proper consideration has been given to the manifold details of the proposition, should pay less than a 5 per cent return on the investment, and many of them pay much more.

The location of the building, the planning and the cost are the all important elements. In the planning, both as to the interior and the office rooms above, too much care cannot be given. A poorly planned office building is foredoomed to failure. A bank building may be most impressive in appearance, yet possess faults of arrangement which cause permanent inconvenience to its occupants.

In these days of strenuous advertising, an impressive bank building, whether individual or otherwise, is at once the best investment and the best advertisement a

THE NEW HAVEN BANK BUILDING, NEW HAVEN, CONN. A BUSINESS STRUCTURE OF UNUSUAL MERIT AND DISTINCTION

bank can have. The investment of capital in a handsome edifice, admirably planned for the carrying on of its principal business, inspires the public with a sense of faith and security in the stability and prosperity of the institution. Increase in confidence brings about increase in deposits; thus the money invested in the new building becomes a satisfactory paying investment and an asset, instead of an expense and a standing liability.

The Fire Hazard in Bank Buildings

There is undoubtedly no class of buildings in which safety from fire is more necessary than in bank buildings. It seems that the American public has become so accustomed to fire losses that it has accepted the annual fire waste as part of the national life.

Few persons ever realize the real extent of a fire loss. The tangible loss is usually covered by insurance, but in many cases the *indirect* loss is even greater. This is particularly true in the banking business. In a bank are housed valuable records and papers which, if destroyed by fire, can never be replaced. Disorganization of a carefully built-up system is the inevitable result of a fire.

It is an acknowledged fact that there is to-day but one unfailing method by which fires in bank buildings may be avoided, and that is by *consistent construction.* The building should be built not only with fire-resistive walls, floor-arches, and having the metal structural members properly fireproofed, but the interior finish and equipment should be fire-resisting to the greatest possible degree.

The recent rapid development of the art of shaping metal to the various forms necessary for this purpose makes it possible to construct and equip a bank building in such a manner that it is impossible for a fire to spread and do serious damage. Metal trim, doors, partitions and window frames and sash are now obtainable, having all the æsthetic qualities of the finer woods and providing no paths along which flame can travel.

Furnishings may be of metal—desks, chairs and filing cabinets, thus avoiding furniture which serves as excellent fuel in time of fire.

The latest developments in metal-filing cabinets are particularly interesting, particularly those of standard makes which have been put to severe fire tests and passed through successfully, serving as perfect protection for the papers filed in them.

Safes which are really fire-resistive are coming rapidly to the fore. To the lay mind nothing could be more fireproof than a heavy steel safe, but thousand of fires have proven the contrary. Steel transmits heat quickly, allowing the burning of contents, and the need for safes which will actually protect contents when subjected to severe fires is recognized.

When the bank building is planned, the additional cost of constructing and equipping the building in a manner that will render the fire hazard negligible, should be considered from a broad viewpoint. This cost will be repaid by lowered insurance rates and cost of maintenance, and by that sense of security from interruption and loss by fire—a security which is invaluable to those engaged in a business, which involves particular responsibilities and requirements.

All buildings illustrated in this article were designed, erected and equipped under the Hoggson Building Method.

Another Blow to the Wood Shingle

AN ORDINANCE—To regulate the construction and repairing of roofs in the City of Montgomery, Alabama.

Be it ordained by the Board of Commisioners of the City of Montgomery, as follows:

That no building or part of any building or structure in the City Limits of Montgomery shall, after the first day of March, 1916, be covered or repaired with wooden shingles; provided, that if any roof is deteriorated or damaged not more than 25%, such damaged or deteriorated portion of said roof may be repaired with the same kind of roofing as th eundamaged or undeteriorated part. No wooden shingles shall be placed on any roof of any building or structure within the Corporated Limits of the City of Montgomery, without obtaining first a permit for same from the City Building Inspector, which shall specify the repairs to be allowed.

Adopted February 2, 1916.

Attest: E. J. Devinney,
Clerk of the City of Montgomery, Alabama.

Broad Scope of Geological Survey Work

The thirty-sixth annual report of the Director of the United States Geological Survey, just made public, emphasizes not only the widespread activities of this scientific and economic organization but their great diversity. The Survey investigations cover every branch of the developed and latent mineral resources of a country whose mineral resources are the greatest in the world. The work of the Survey is conducted under three scientific branches and includes three corresponding kinds of activity. Under the geological branch, investigations are made concerning the mineral resources of the entire United States and Alaska, ranging from truly exploratory surveys of regions practically unknown to white men to the most detailed geological examination of mining camps. Last year 76,000 square miles were thus geologically examined.

Work of the Survey that is even more of a pioneer type, however, is done by the topographic engineers, who have made surveys during the year in 30 States, as well as in Alaska and Hawaii. The Survey's topographic map is the base or mother map of the U. S.

The other scientific branch of the Survey is that which conducts investigations of water resources, including the measurement of the volume of the important rivers of the country and their tributaries, as well as the study of underground water resources. Stream measurements are carried on from year to year, and the engineering data thus obtained are used in all kinds of hydraulic engineering, such as projects involving power, irrigation, drainage and flood prevention.

Another important feature of the Geological Survey's work is the collection and publication of mineral statistics. Survey geologists are in correspondence with some 90,000 miners, mine operators and mineral producers, whose output covers all the useful minerals, and the data thus obtained are published by the Survey in reports on seventy-five subjects. The total appropriation provided by Congress for the Geological Survey during the current year is approximately $1,500,000.

SECOND NATIONAL BANK

A public space of generous proportions and handsome design. Designed and constructed under the Hoggson Building Method.

Co-operation in Business for the Public Good

By S. G. Webb, Secretary, the Gypsum Industries Association

THERE is an enormous opportunity for constructive work by intelligent co-operation among all of the important industries engaged in the work of supplying fire-resistive materials for building construction.

It has been the fashion among industries who supply materials for construction to consider that their interests were in a large measure opposed. It will be my effort in this article to present the thought that the interests of the various businesses are not opposed, but are wholly in harmony and that it is the sensible and logical thing for these industries to all pull together.

War is destructive and co-operation is constructive, and the greater the number of persons or industries that work together in co-operation to build up, the greater the constructive achievement will be. We are having an object lesson of how property can be destroyed by war in the European conflagration and a distinct parallel can be drawn between the destructiveness of war among nations and the destructiveness of war among industries. They are equally disastrous. To build up what has been destroyed will require the co-operative efforts of the nations now at war. If this is so among nations it is equally true among industries, as there is an enormous quantity of property, in the form of buildings, which is being destroyed every year by fire, which the industries in co-operation could and should reconstruct and reconstruct in a manner that would make these buildings reasonably secure against damage by fire.

What, after all, is the reason of war? Is it not the fact that men misunderstand each other; misunderstand the motives that actuate their fellows, and does it not follow, therefore, that a direct means for stopping warfare is for men and nations to get to know each other better?

When I speak of men, therefore, I refer to men in the individual industries and, in the larger sense, to the industries that are engaged in similar functions, who are engaged in producing possibly dissimilar products for similar uses.

We can not separate the two facts that we in this country—and in Canada—are suffering from a fearful loss during each year from fire and that by far the larger proportion of buildings are constructed so that they will readily burn.

Stating these facts in figures we find that the average direct fire loss amounts to about $250,000,000 per year, and that only eight-tenths of one per cent of all building constructed in this country are so-called "fireproof," and that ninety-nine and two-tenths per cent are built so that they will readily burn. The correctness of these latter figures may possibly be questioned, but we do know—and this is not open to question—that by far the larger proportion of buildings erected are built so that they will readily burn.

It would appear, therefore, that right here, in the attacking of this problem and these two related facts, that the industries who supply fire-resistive materials for building buildings, through intelligent co-operation should be able to effect an enormous improvement and benefit to the country, and it does not require the exercise of very much imagination to see what enormous benefit to the country as a whole might occur if these industries were to co-operate to lessen the fire waste by bringing about a greater use of fire-resistive materials of construction.

Classifying Building Construction

Perhaps the first thing that the industries should consider would be some definite plan by which building construction as a whole could be classified in accordance with its fire-resistive value. It is a peculiar fact that we, in this country, are entirely out of accord with the attitude on this broad fundamental question which is maintained by the principal European nations. In England, many years ago, the British Fire Prevention Committee, which exercises practically the same functions in that country as does the National Board of Fire Uuderwriters in this country, adopted a plan of classifying buildings into three broad classifications in accordance with their fire-resistive value, and this plan was endorsed and adopted by the International Fire Prevention Congress, which met in London in 1903.

Here, then, is a ready-made plan, the value of which has been proved.

Should the important industries in this country all agree that this plan of the International Fire Prevention Congress is fundamentally sound and then adopt the plan, it would perhaps be the best and first step in a constructive program to attack the problem of our national fire waste.

The total economic loss from which our country suffers from fire is not begun to be told in the actual fire-loss figures which are so frequently published and which, for the sake of argument, we may consider as averaging $250,000,000 per year. To this should be added the greater cost of protection through the maintenance of fire departments, etc., the loss through interruption to business, the economic loss right on down the line from which a great number of persons innocently suffer and which, in the aggregate, would amount to stupendous totals if it was possible to express them in dollars and cents.

It therefore seems reasonable to regard this great economic loss from which our country suffers each and every year as a subject worthy of the attention of the United States Government. It would seem that if the development of information regarding structural materials were conducted by the United States Government, that this would very greatly help the situation and would amply repay the country as a whole, even if it did cost money. Such cost must be infinitesimal as compared with the cost of the fire waste and would be amply justified by the returns in the saving of lives and property. This, then, seems to be the next logical step in a constructive program, viz., to get the United States Government aroused and ready to help.

Our suggestion, therefore, is that these industries should co-operate with the United States Government in working out problems, and that the United States Government should be urged to extend the work and functions of some of its bureaus—say the Bureau of Standards—to develop more information than we have at present on these materials of construction.

The steps in a constructive program would seem, therefore, to be logical. Starting with the adoption of a sensible plan, such as classifying buildings, then the work would soon ramify out into directions that should bring about ultimately the general adoption of the plan and in this way we would ultimately get uniformity of treatment of this broad fundamental question in this country by the government, cities, states, industries, and national agencies generally.

I do not believe that these thoughts are too utopian, but I believe that they can be actually carried out. Should they be carried out, and they will if the industries will awake to their responsibilities and opportunities, then the reproach of our criminal national fire waste will, I believe, be ultimately a thing of the past.

In the March Issue of CONSTRVCTION

Hollow Metal in Safe Building Construction

By Wm. Wallace Ewing, C.E.

The Development and Application of Hollow Steel Doors and Trim, Units of Incalculable Value from the Standpoint of Safety Against Fire, Will Prove an Interesting and Instructive Article. Methods of Manufacture and Good Practice in the Use of this Material will be Discussed.

A Complete Fire Alarm and Supervisory System

By Bruce E. Loomis

In the matter of fire protection in any building, one of the important factors is the alarm and supervision system. In the Equitable Building in New York City, as referred to in an article on fire protection in a recent issue of CONSTRVCTION, there is an alarm and supervisory system so complete and admirable in its working that a detailed description of the installation will undoubtedly prove of interest to the building fraternity.

The system consists of fire alarm connections with the City Fire Department, a local alarm system, a special code system for calling employees, operated from the Fire Chief's office (in the building), and a supervision for the reporting of night watchmen.

The alarm connection with the City Fire Department is operated as follows:

Manual fire alarm boxes, which connect with the central office of the National District Telegraph company, are installed in locations on each floor, as required by the Underwriters. In the event of fire a glass panel in the manual box is broken and an alarm is transmitted to the central office by pulling down a hook, with the result that the city's fire apparatus responds to the location indicated by the box.

The box consists of a heavy mechanical movement suitably encased in a double iron shell. Proper code signals are driven by the mechanical movement, which is set in motion by the operation of the pull lever. These code wheels interrupt a closed metallic circuit directly connected with the central office and record signals there. The circuit arrangement is such that signals will be received at the central office even though the lines connected with the Equitable Building are open or grounded, thus giving a double assurance of the transmission of the alarm.

Local Alarm System

On each floor are two electro-mechanical gongs for use only in case of fire for the purpose of notification. These gongs are operated from the same boxes used for the central office fire alarm, but over an entirely independent circuit, in a manner slightly different from that employed in general fire alarm service. The gongs are placed on 41 different circuits, each terminating on the switchboard in the Fire Chief's office, and are normally under constant test, which shows the line to be in operative condition.

There are also 192 tapper bells for the purpose of notifying employees in the event of fire, arranged on 24 circuits and located in the corridors of each floor. It was not deemed expedient to operate all the electro-mechanical gongs and disturb the entire building in the event of a fire, but it was necessary that all employees be promptly advised of such occurrence, consequently the use of tapper gongs was considered essential. In the event of fire, when any box is pulled, a local circuit, which is separate and distinct from central office circuit, is broken, which connects with controlling relays in the Fire Chief's office. These relays automatically operate the 24 tapper circuits simultaneously, giving the alarm on all tapper bells throughout the building, as well as sounding an alarm and recording same in the Fire Chief's office.

When deemed advisable an alarm can also be transmitted over the electro-mechanical gongs on the different floors from the Fire Chief's office. The operator, reading the signal as it comes in on the tape, sets up the number he desires to transmit and at the same time throws the local gong circuit into ringing position. He will select such floors as are most likely to be affected by the fire and rings only these, the other gongs being idle and causing no alarm to tenants in the rest of the building.

It should be noted that there are two distinct sets of sounding apparatus throughout the building and controlled by entirely different circuits. The 24 tapper circuits are operated automatically by the manual fire-alarm box when it is pulled. The 41 electro-mechanical gong ciruits are always available for alarm purposes, but are only used when conditions warrant. They are under the chief operator's control, and he simply throws the switches on such circuits as he desires to operate.

The alarm to the City Fire Department is transmitted independently of this local alarm, and the fire department is being advised at the same time the building alarm is ringing.

Supervision of Night Watchmen

It is necessary to have night watchmen patrolling the building nights, Sundays and holidays; and a system of supervision has been employed using the same box that is used for fire—alarm service in the regular method employed by the A.D.T. system.

Each watchman is provided with a key, makes his rounds on a definite schedule of time, and is due to register his station at a certain period. This he does by inserting the special key in the fire-alarm box and giving it a slight turn. The turning of this key sets the transmitting mechanism in motion and gives one round of the code number in the District Company's central office. The watchman is checked off by the operator if he pulls the box on schedule time.

The specified route and time for each watchman must be followed by him in making his rounds, but he is allowed 15 minutes' grace. In case he does not pull the box within this time a "runner" from the central office is dispatched to ascertain the cause of the delinquency and to get a written explanation. In event the watchman is ill or otherwise disabled, another man is substituted to take his place, so that the protection remains continuous. A daily report covering the failures of the watchmen each morning is furnished to some one designated in authority, and any irregularities are thus promptly noted. The use of the box for transmission of watch signals practically guarantees the operation of the fire alarm service, as every time the watchman turns in the signal he is testing the box and the line to the central office.

The Code Signals

The 193 tapper bells mentioned before are also used for emergencies of any kind where it is desired to obtain the proper response of the employees, and special code numbers can be sent out by the chief operator in the building over the circuit, which will indicate action desired by the night watchmen, porters or others engaged in the building. The use of this call system keeps the employees all within the reach of the chief operator.

The local alarms of all kinds are under the direct control of the operator in the Fire Chief's office. At this point are located the batteries and charging apparatus, relays, switches and all other elements necessery for the operation of the system. The operator can tell at a glance whether everything is in normal condition, and by means of drops has visible notification of any trouble on any of the circuits. Inasmuch as he is in charge of the local fire brigade, it is essential that he may thus communicate with his entire staff by means of the tapper arrangement provided.

A well-trained fire brigade is maintained under the direction of the building chief, and fire drills are systematically held in order to familiarize tenants with the fire alarm system.

No building of any type is complete without the installation of proper fire alarm and watchmen's supervision systems. There are hundreds of fires occurring annually which might have been prevented had proper alarm devices been used. With the watchman enters the human equation, and unless he is checked by some reliable system, incipient fires will continue to spread until great damage is done. Every building in which fires occur at some time other than during business hours has one or more watchmen. The very fact that the fire was allowed to get far beyond control shows plainly that the watchman was asleep, away, or that some accident had occurred to him. Only recently a great tobacco warehouse was completely destroyed with severe loss because while one watchman went out for sandwiches the other fell asleep and was awakened only when the floor beneath him got too hot for comfort! Here a proper alarm system with the movements of the watchman checked would have insured more vigilance and a probable saving of $500,000.

The fire alarm and watchmen's supervision problem is far too important to neglect or give but cursory attention to. Study the need when you plan to build—get in touch with reputable alarm and supervisory systems. You will be many times repaid.

Safe

Construction

of Hotels

By Bruce E. Loomis

will appear in an early issue of

CONSTRVCTION

Fireproofing with Gypsum

The following letter, containing interesting facts and tables relative to the use of gypsum products in fire-resistive building construction, has been received by CONSTRVCTION *from* VIRGIL G. MARANI, *former Building Commissioner of Cleveland, Ohio, and well known as a fire prevention engineer. Mr. Marani, a member of such organizations as the British Fire Prevention Committee, National Fire Protection Association, American Society for Testing Materials and the Society Advocating Fire Elimination, is particularly well qualified to speak on the subject in hand.*

"It was with a great deal of interest that I read Mr. William Wallace Ewing's article in CONSTRUCTION entitled "The Proper Fireproofing of Structural Metal." (See December, 1915, issue, pages 163-168.) Mr. Ewing's article covers, in a general way, the subject of the protection of structural metal members within exterior walls and steel work exposed to the elements, viz.: steel tank supports, etc.

Mr. Ewing's illustration of an unprotected steel tank support, set between two three-story buildings of "ordinary" combustible construction, is a striking instance of a prevalent though extremely dangerous prac-

ORDINANCE 96, PASSED JULY 16, 1915.

NEW YORK CITY 1915 BUILDING CODE (Not yet completed).

No.	GYPSUM TILE USED FOR THE FOLLOWING PURPOSES.	GYPSUM TILE AND THICKNESS—FIREPROOF BUILDINGS.
1	Col. Protection—Interior Cols.	Solid 2″ thick
2	Col. Protection—Exterior Cols.	Masonry covering
3	Beams, Girders and Truss protection—See Note A	Solid 2″ thick
4	Lintels over 4-ft. span—protection	Solid 2″ thick
5	Roof Deck Tile (Reinforced or not Reinforced)—See Note B	Solid 2″ thick for 2-ft. span, add 1″ for each additional foot span
6	Floor construction	Gypsum composition
7	Shafts to Stairways and Elevators	Hollow Gypsum 6″ thick. Webs not less than 1″
8	Partitions—Main Corridors	3″
9	Partitions—Fire Exit	3″
10	Partitions—Minor	Incombustible materials

NOTE A.—Roof trusses having a clear height of at least 20 feet below the lower cords need not be fireproofed.

NOTE B.—Gypsum Deck Tile on fireproof buildings, only on roofs sloping 30 degrees or more to the horizontal, in other buildings approved if strong enough.

FIREPROOF BUILDINGS

1 Sec. 351 (2-b) Sec. 351 (6) Sec. 351 (e), Sec. 351 (f)
2 Sec. 351 (2-a)
3 Sec. 351 (3), Sec. 351 (5-a)
4 Sec. 351 (4-a)
5 Sec. 351 (5-b)
6 Sec. 354 (5), Sec. 352 (5)
7 Sec. 358 (1) See letter of approval, Oct. 6, 1913
8 Sec. 355 (1-f)
9 Sec. 355 (1-f)
10 Sec. 355 (1-g)

Code section reference to numbered lines above.

tice; whether on independent supports, or upon steel framing above buildings, the steel supports of all water tanks should be protected against possible fire, as suggested in the article in question.

For the "fireproofing" of interior steel construction in a building, both the 1915 edition of the National Board of Fire Underwriters' Code and the revised 1915 New York Building Code agree upon the use of gypsum for this purpose.

The tables herewith enclosed show the uses for which gypsum is recommended in the former case and specified by law in the latter.

These uses include Column, Truss, Girder, Beam and Lintel protection, Roof Construction, Stairway and Elevator Enclosures, Main Partitions and Fire Exit Partitions.

NATIONAL BOARD OF FIRE UNDERWRITERS

1915 Building Code

No.	Gypsum Plaster Board Used for the Following Purposes.	Height of Building.	Ordinary Construction—Gypsum Plaster Board.
1	Shafts to Stairways and Elevators and over 6 sq. ft. area	Not over 75 ft.	½" Plaster Board on wood studs covered with sheet metal.
2	Partitions—Main Corridor	See Note A	Incombustible materials to test 1700 for 2 hours
3	Ceilings, Cellar or Basement	Two or more stories See Note B	½" Plaster Board plastered to ¼" grounds or covered with sheet metal.
	Dwelling Exempt	Frame	Construction
4	Shafts to Stairways and Elevators and over 6 sq. ft. area	Business above the 1st floor	½" Plaster Board on wood studs plastered to ¾" grounds, or covered with sheet metal.
5	Dividing Walls or Partitions	Buildings built in rows	½" Plaster Board and plaster.
6	Ceilings, Cellar or Basement	More than one-story	½" Plaster Board plastered to ¼" grounds

Note A.—Existing buildings over two stories high and used above 1st floor for public or business; or for any purpose if over three stories.

Note B.—Tenements and Dwellings, two or more stories; Club Houses, Hotels, Factories, Lofts, Office Buildings, Stables, Factories, Workshops.

No.	Ordinary Construction.	No.	Frame Construction.	
1	Sec. 94, Par. 1	4	Sec. 190, Par. 4	Code section reference to numbered lines above.
2	Sec. 116, Par. 1, Sec. 174, Par. 4	5	Sec. 190, Par. 1	
3	Sec. 7, Par. 12, Sec. 99, Par. 5	6	Sec. 191	

The conclusions referred to, and embraced in these two most effective and prominent set of building regulations, were arrived at after exhaustive research work, coupled with an investigation of standard architectural and engineering practice throughout this country and Europe.

Any material used for the protection of metal structural members against the action of fire must possess the following qualifications in about the following order of merit:

1—Low heat transmission (conductivity), viz.: poor heat conductors.

2—Low total amount of expansion.

3—Homogeneous as a unit and as a whole after erection.

4—Light weight.

5—Ease of application.

6—Low initial cost.

The National Board of Fire Underwriters' Laboratory's calculation test, made in 1912; the New York Building Department's Column Protection test, made in 1903; the United States Bureau of Standards, Pittsburg, test made in 1914, all show gypsum to possess the necessary qualifications for the fireproofing of steel to a higher degree than any other known and universally used material.

The recognition of gypsum as a suitable material for the protection of steel is also evidenced in the joint tests to be conducted this year by the National Board of Fire Underwriters, Associated Factory Mutual Fire

Insurance Companies, and the National Bureau of Standards, in which loaded columns of standard design, protected by concrete, clay tile and gypsum, as now practiced, are to be officially tested."

NATIONAL BOARD OF FIRE UNDERWRITERS

1915 BUILDING CODE

No.	GYPSUM TILE USED FOR THE FOLLOWING PURPOSES.	GYPSUM TILE AND THICKNESS—CONSTRUCTION.		
		Fireproof	*Non-Fireproof*	EXISTING BUILDINGS—NON-FIREPROOF
1	Col. Protection—Interior Cols.	Solid 3"	Solid 2"	
2	Col. Protection—Exterior Cols.	Masonry only	1" Metal Lath Cement Plaster	
3	Girder and Truss Protection	Solid 2"	Solid 2"	
4	Beam and Lintel Protection	Solid 1½"	1" Metal Lath Cement Plaster	
5	Roof Deck Tile (Not reinforced)	Solid 3" up to 25" span		
6	Roof Deck Tile (Reinforced)	Allowed up to 30" span		
7	Shafts to Stairways and Elevators	Solid 6"	Solid 5"	3"
8	Shafts over 6 sq. ft. in area	Solid 6"	Solid 5"	3"
9	Shafts under 6 sq. ft. in area	Solid 3"	Solid 3"	3"
10	Partitions, Main Corridor	4"	3"	3"
11	Partitions, Fire Exit	5"	3"	3"
12	Partitions, Minor	Incombustible materials		

NOTE.—In Mill constructed buildings the stairs and elevator shafts shall be enclosed by masonry walls. Sec. 109.

	No.	FIREPROOF.	NON-FIREPROOF.	EXISTING BUILDINGS.
Code section reference to numbered lines above	1	Sec. 112, Par. 3, 5 (a), 5 (c)	Sec. 114, Sec. 112, Par. 3, Sec. 105, Par. 3	
	2	Sec. 112, Par. 1	Sec. 114, Sec. 105, Par. 3	
	3	Sec. 112, Par. 3, 6 (a)	Sec. 114, Sec. 112, Par. 2, 3, Sec. 105, Par. 3	
	4	Sec. 112, Par. 3, 6 (a)	Sec. 114, Sec. 112, Par. 2, 3, Sec. 105, Par. 3	
	5	Sec. 111, Par. 7		
	6	Sec. 111, Par. 7		
	7	Sec. 90 (d)	Sec. 93, Par. 1	Sec. 94, Par. 1
	8	Sec. 90 (d)	Sec. 93, Par. 1	Sec. 94, Par. 1
	9	Sec. 91, Par. 1	Sec. 91, Par. 1, Sec. 93, Par. 2	Sec. 94, Par. 1
	10	Sec. 115, Par. 1, 2, 3, 4, 5	Sec. 116, Par. 1	Sec. 94, Par. 1
	11	Sec. 47, Par. 1	Sec. 47, Par. 3, Sec. 97, Par.3	Sec. 94, Par. 1
	12	Sec. 115, Par. 2, 3, 4		

Poughkeepsie Resents Criticism

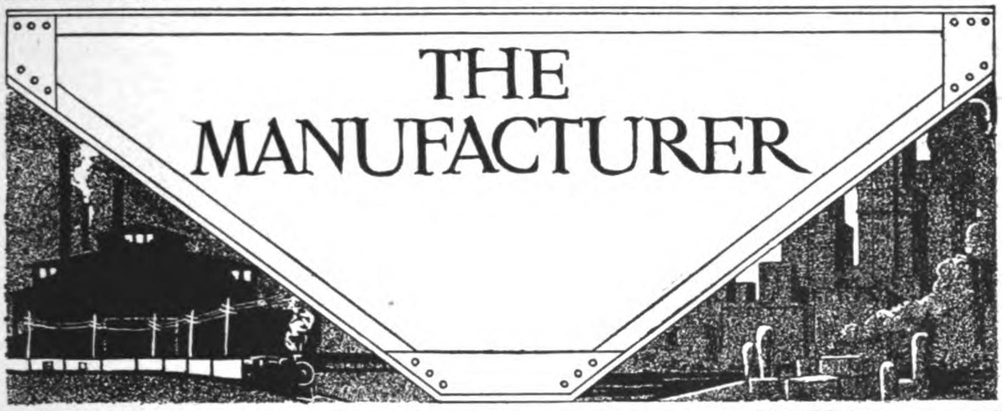
Taking vigorous exception to the criticism of the building conditions and the fire and water services of Poughkeepsie, N. Y., recently made by the National Board of Fire Underwriters, the city chamberlain, by direction of the council, has demanded a retraction from the insurance men.

The underwriting engineers asserted that Poughkeepsie's building code is lacking in many of the most essential features, with the result that flimsy construction is freely indulged in, creating a fire hazard by no means counteracted by the existing fire-fighting force.

The fire alarm system is condemned as being "entirely inadequate for a city of this size, and is heartily condemned by members of the fire department and a large number of citizens." Fire Chief G. B. Wood holds that the Poughkeepsie fire department "is second to none," and that the record of fire loss for 1915 will prove such to be the case.

Additional Plans Charged For

In future, Cincinnati contractors who carelessly lose or destroy working plans must pay $5 before they secure another set, architects and property owners feeling that a penalty must be imposed to compel greater care in this respect on the part of builders.



¶ Co-operation is sounding a new note of progress across the vast fields of American industry.

¶ Here is a great undeveloped market for your product.

—"AND IT'S YOUR FIGHT!"

S-A-F-E is attracting attention.

Not only from the lumber journals, but within the ranks of the makers of fireproof materials.

Inquiries are becoming more and more frequent. Inquiries relative to the organization, its scope and aims.

And Constrvction, its official journal, is being accorded a cordial welcome wherever it appears.

All of which is pleasing and most encouraging.

But yet falls short of the mark.

These two, S-A-F-E and Constrvction, are the only two agencies in America which devote their entire effort militantly in behalf of firesafe building.

Both are educational, both seek to impress upon the prospective builder the wisdom of taking every possible precaution against disaster. Both advocate safety first.

And the more effectively they are able to drive their arguments home the more will the home-owners of the future, the store and factory and the endless array of other owners build against the sounding of the fire alarm.

Which will mean a constantly increasing demand for fireproof, firesafe and fire-resistent building materials.

Wherefore S-A-F-E should be gathering members from the highways and byways.

And Constrvction should be claiming the enthusiastic support of every fireproof building material manufacturer whose business foresight equals that of the man who refuses to build to burn.

For it is a field of tremendous possibilities toward which these two are blazing a new trail for the manufacturers of firesafe materials.

It comprises 99 per cent of the buildings erected annually in the United States.

For less than 1 per cent are fireproof!

Pause a moment, Mr. Manufacturer, and let this sink in.

You have been doing fairly well with only 1 per cent to work on. For, of course, there was always a liberal use of your materials in the other 99 per cent.

Last year the building outlay in the United States aggregated something in excess of $849,563,000.

Suppose it were possible to increase the consistently firesafe buildings to 10 or 15 per cent of the whole! How much better you might be doing!

And that is the goal toward which S-A-F-E and Constrvction are fighting.

And it's your fight!

How much of the munitions are you furnishing?

Regardless of whether you are contributing your share you will receive your pro rata of the ultimate benefits. If you get out and hustle hard enough you may even outstrip the fellow who is contributing.

And you may be proud of it.

But don't dodge your taxes.

After all that's about what it amounts to.

If you are manufacturing a fireproof material and are contributing to a fund for advertising it upon the community plan insist that Constrvction be recognized in this advertising campaign.

No publication in America to-day has a better claim.

If you are not in a community advertising campaign, then favor Constrvction with some of your individual publicity.

Help us to help you!

And don't overlook S-A-F-E. Get in line and push.

If you don't know just what S-A-F-E is, what it means and what it is fighting for, it will cost you two cents to find out. S-A-F-E is always willing to tell the story of its life.

And right here a word to S-A-F-E members.

How many of you are open to the charge of non-support of your child? i. e., Constrvction.

All of you are mightily pleased with the youngster. All of you are proud of the way it is growing, of the improvement it shows from month to month. All of you want to see it live long and prosper. All of you know it is fighting your battle ably and well.

But there is one thing some of you have not realized.

The advertising solicitor can appeal to the average manufacturer only upon the broad lines of the common good that will result from CONSTRVCTION'S educational campaign. There are other more or less direct arguments, but when you get right down to brass tacks that is the essence of it all jise now.

A year hence CONSTRVCTION'S value as an advertising medium will have increased one hundredfold. By that time it will have proved itself. It will have established its field and will have won recognition for what it is and what it is fighting for. In a word, it will have arrived.

Every member of S-A-F-E and every manufacturer of fireproof materials knows that the field is there, and that CONSTRVCTION is hitting the bull's eye!

But S-A-F-E members seemingly do not all appreciate that just now their advertising support is imperatively necessary, particularly in sections where S-A-F-E is strongly represented.

Without them, nine times out of ten, the non-member manufacturer cannot be interested.

However much he may be impressed with the magazine proper, he runs through the advertising pages and abruptly declares:

"Where are your S-A-F-E members? If they don't support you why should I?"

And it's all off.

When completed, the moving picture playhouse to be erected on Ocean avenue, Greenville, N. J., by the Orient Amusement Company, will have cost about $28,000.

How Sprinklers Protect Property

Convincing proof of the value of automatic sprinklers in the protection of property against loss by fire is supplied in a series of interesting tables newly issued by the Boston Manufacturers Mutual Fire Insurance Company, of Boston, one of the most prominent of the mutual organizations of New England.

The figures in question show the premiums and losses of the company for three periods: one from 1850 to 1875, inclusive, during which time the mills were unequipped with automatic sprinklers. The second period—from 1876 to 1895, inclusive—covers the time during which the plants were being equipped with automatic sprinklers, some fully and others partially, and others not at all. The third period—from 1896 to 1915, inclusive—covers the time when the mills were fully equipped with automatic sprinklers. In the early part of this division some of the storehouses connected with the mills were unequipped, but later on these were fully equipped. The table followes:

	Amount	Losses	Rate Loss to Amount Written Per $100
1850-1875, inc.......	$406,284,084	$1,027,536	$0.2529
1876-1895, inc.......	1,551,259,471	2,809,203	.1810
1896-1915, inc.......	5,068,784,690	2,613,215	.0515
65 years	$7,026,328,245	$6,449,955	$0.0917

In the light of the above, which but confirms the opinion already formed by those who have intelligently studied the sprinkler question, the prediction of a leading underwriter "that the next ten years will witness the enforced protection by automatic sprinklers of every school house, department store, church, theatre or other place of public assembly in the country" is easily accepted.

Recent Building Projects

To replace that section of its plant burned a short time ago with a loss of $25,000, the Winsted Edge Tool Co., of Winsted, Conn., is rebuilding with brick, improving especially all fire features.

A fireproof building is to be erected at Wilmington, Del., by William Beadenkopf, to replace the four-story warehouse burned early in the year.

A new plant, "all on one floor and of the best fireproof construction," will be erected by the Belle Mead Sweetmakers, of Trenton, N. J., to replace their property recently burned. The destroyed plant resulted in a loss of close to $70,000. The cause of the fire has not yet been determined.

President D. W. Hughes, of the Rhea Springs Company, Chattanooga, Tenn., places the loss occasioned through the recent fire in his property at about $40,000; caused, it is suspected, by crossed electric wires. Should the company conclude to rebuild, it will erect a "fairly-fireproof structure and equip it with automatic sprinklers."

Charles Duncan, secretary of the Morton L. Marks Company, wholesale grocers of Davenport, Ia., advises of his company's determination "to buy new property and construct a modern reinforced concrete fireproof building." The former property of the Marks Company was a four-story, well constructed building. The building was not protected by a sprinkler system, hence a serious loss was occasioned when fire occurred some weeks ago.

A Retrograde Move

Commenting upon building conditions in Meridian, Miss., from a fire hazard standpoint, an eminent underwriting engineer said recently:

"Recommendations formerly made looking to the fire-safety of the city have not only been disregarded, but a retrogression has taken place through the repeal of the ordinance requiring non-combustible roof coverings and the abolishing of the office of fire marshal. The excellent ordinance passed in February, 1914, requiring all new and extensively repaired roof coverings throughout the city to be of incombustible materials, has been repealed."

That the fire chief of Meridian is alive to the menace of the wood shingle roof is evidenced by the activity he is displaying in seeking the re-enactment of the safety ordinance.

Recommends Changes at Augusta, Ga.

Nisbet Wingfield, city engineer and commissioner of public works, at Augusta, Ga., holds that the building laws of his city "should be amended in several instances," and that "the powers of the building inspector should be more clearly defined, especially in reference to old buildings." The installation of electric wires, Mr. Wingfield asserts, "should be given especial care, as imperfect work in this connection is one of the greatest fire hazards we have to contend with."

Afraid of Shingle Roofs

Fire Chief Frank G. Reynolds, of the same city, takes a hard crack at the wood-shingle roof in his annual report, and strongly recommends to the city council the enactment of an ordinance prohibiting the further use of this fire breeder within the corporate limits.

The chief's report shows that of 446 fires in Augusta during 1915, 246, or more than 50 per cent, were caused by shingle roofs, 29 such fires alone following the burning of the Riverside Compress.

To quote Chief Reynolds: "This is conclusive that shingle roofs are a menace to any city, hence the covering with shingle roofs should not be permitted within the city limits. Only fireproof roofing should be permitted in erecting new buildings or in making repairs to old roofs."

During the twelve months ended December 31, 1915, 237 new buildings were erected in Augusta at a total cost of $585,474, while repairs to existing structures cost an additional $88,522.

In the same period the loss by fire aggregated $605,525.37, $105,801.81 of which was on buildings and $499,723.56 on contents. The insurance paid upon these items was $101,965.71 and $494,768.56 respectively.

The fire causes were as here given:

Sparks on shingle roofs	246
Defective flues	38
Defective wiring	11
General alarms	7
False alarms	9
Unkown causes	135
	446

Overlook an Important Feature

It is expected that a revised building code will shortly be offered for adoption at Sioux City, Iowa, and the prediction is made that it will be enacted without material change.

The new code has many admirable features, and is especially noteworthy for the extension of the fire limits which it provides. It is a matter for regret, however, that the author of the code failed to insist upon the use of incombustible roof coverings only. In a city subject to such high winds and intense cold as is Sioux City, it is easily conceivable what would happen should a serious fire get underway and flying brands were scattered about on a winter night.

Sparks and Shingle Roofs

In analyzing the fire loss of Ohio for 1914 (the 1915 report is not yet ready for distribution), State Fire Marshal E. R. Defenbaugh pays his respects to the wood-shingle roof in the following terse paragraphs:

"Sparks were even more prolific as a cause of fires than the deflective flue. They came from chimneys, locomotives, smokestacks and traction engines, and combined were successful in their evil mission in 811 cases and carried a loss of $917,658, almost one-seventh of the entire loss in the State.

"As has frequently been remarked before, had the roofs of the buildings burned in these instances been of fire-resistive material, instead of combustible material, most, if not all, of the million dollars' worth of property would have been saved.

"The number of fires attributable to this cause was nearly double that of last year, which was 422."

West Hoboken, N. J.

That the present building code of West Hoboken, N. J., inadequately meets the requirements of the day, is the candidly expressed opinion of Chief Engineer Frederick Schier, of the Fire Department, who recommends drastic ordinance revisions.

During 1915 the chief reports: The fire loss was $27,640 upon property valued at $798,700. The gratifying reduction in loss from the previous year is attributed by Chief Schier in large part to the careful inspection service, which prohibits the accumulation of paper and rubbish generally in cellars and outhouses.

Sue for Compilation of Code

For alleged services in compiling and editing a new building code for the city of Bayonne, N. J., Jacob Hassmiller and Andrew Walsh have brought suit for $700 and interest from March 1, 1915, against the community.

New Jersey Compensation Laws

Amendments to the Workmen's Compensation Law of New Jersey are provided for in a measure now before the State Legislature. The bill will broaden the present scope of compulsory insurance, and raises the scale of compensation to injured employers.

Prohibit Wooden Exposure

Profiting by its recent serious fire, Greenboro, Fla., proposes to in future prohibit within certain defined areas the further erection of "any structure having wooden exposure," according to Town Clerk J. H. Wells.

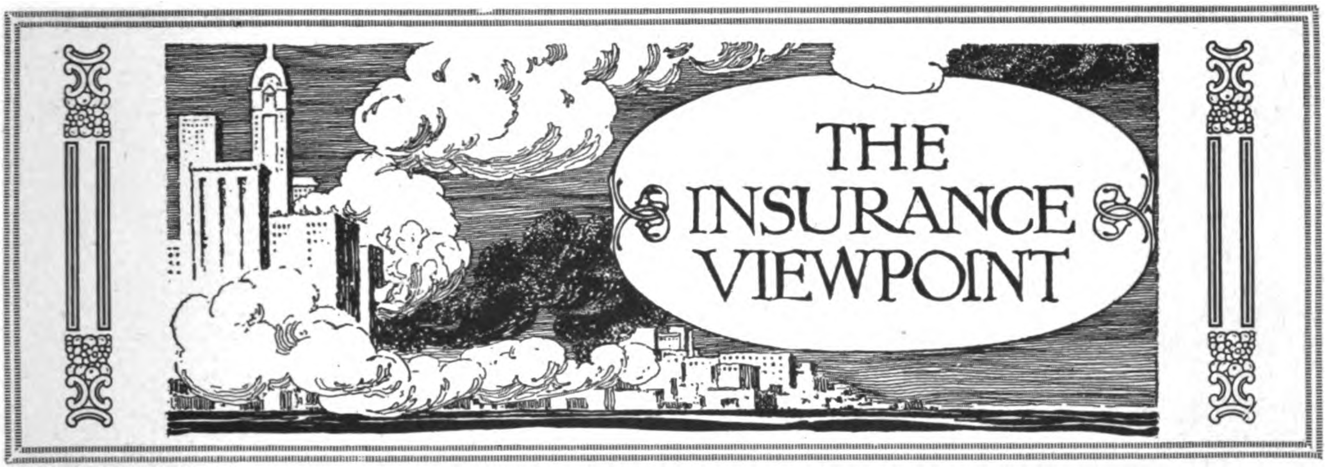
Aid of Masons and Bricklayers Sought

A direct appeal to members of the Bricklayers, Masons and Plasterers International Union to aid in extending present fire limits in cities of the United States and Canada was made by Secretary Frank H. Wentworth, of the National Fire Protection Association.

Addressing the brickmen at their recent convention in Toronto, Mr. Wentworth said in part:

"The interests that fight all such extensions of fire limits will say that in excluding wood construction you are cleverly making jobs for yourselves. Do not dodge the issue. Meet it frankly. Point to Salem and Chelsea and the hardships of the working class in all such conflagrations; point to the heavy fire tax you are sharing with all other citizens, and challenge the opponents of such measures to show an equal coincidence of selfish interest with the public good. They cannot do it. In Boston I have closely watched such a fight—taken part in it. The men who fought the extension of the fire limits in Boston and, after the fight had gone against them, plotted with the city council to reverse their actions at a secret meeting were not those seeking to construct buildings which would be a credit to the city, but the contrary. Those who fought the common safety were not men who wished to build houses for themselves to live in, but men who wished to build houses for other men to live in, principally workingmen and the families of workingmen.

"Reputable builders have worked out beyond dispute the fact that a brick building costs but 10 or 15 per cent more than a wooden building—upkeep considered. The assertion that the working class cannot be adequately housed unless wooden construction is permitted is, therefore, untrue. I can produce in proof actual figures and responsible builders to bid on them. There is no excuse for the housing of the working class in wooden three-deckers, except that they pay for themselves in ten years out of the rents you pay—unless you are turned into the streets by a fire, when the insurance companies complete your contract. If they don't burn in ten years they become an eyesore and disgrace to the city, ruining the land values of the entire neighborhood. Such buildings are not desirable nor legitimate investments, and in opposing their erection you are rendering a worthy public service. The lumber interests will naturally be found in opposition. Their motive needs no explanation. They have recently appealed to the carpenters' unions to do the very thing I am suggesting to you—only on the opposite side. I dislike to see the working class divided, but perhaps you can win over the carpenters to a bigger outlook. They will get the inside work to do, anyhow—which is much pleasanter this zero weather.



THE INSURANCE VIEWPOINT

Rates in Jersey City

Contending that because of large additions to the fire-fighting equipment of Jersey City the fire hazard was considerably below what it was formerly, the authorities of the city are demanding lower insurance rates. To attain that end they have called public meetings, inviting all citizens who feel they have been unjustly dealt with by the insurance companies to present their complaints supported with whatever evidence they possess.

An effort to repeal the special law under which the fire insurance companies are operating in New Jersey will be made at the present session of the State Legislature.

In defining their position the underwriters state that under the existing practice rates throughout the Commonwealth are based upon exact hazards measured according to a definite schedule, and that it lies within the province of every property-owner to make his insurance practically what he will, through so improving the defects in his building as to minimize the fire danger.

Every risk in the State is rated strictly upon merit and no discrimination is permitted. Business men who have intelligently followed the workings of the insurance companies in New Jersey find no fault therewith, and aside from the agitation in Jersey City there has been no criticism of their acts anywhere in the State.

Would Co-operate With Underwriters

Appreciating the good work performed by the insurance interests in the inspection of properties and their insistence upon certain standards of protection as a prerequisite to granting insurance, J. P. Jackson, Commissioner of Labor and Industry in Pennsylvania, seeks closer co-operation efforts with the underwriters in reducing the fire hazard of the State.

Addressing Louis Weiderhold, Jr., secretary of the Underwriters Association of the Middle Department, under late date, Commissioner Jackson said:

"Mr. Lew R. Palmer, chief inspector of the Department of Labor and Industry, has sent me your letter with the enclosed list of your fire reports. Mr. Palmer states that we are getting excellent co-operation from you in this matter. We sincerly hope that you will go even further and make as complete and full reports to us where the conditions are not only dangerous with reference to mills, but also with reference to the escape of human beings in case of fire. If you will do this you will certainly be serving the Commonwealth of Pennsylvania well, and will at the same time, I believe, do much in your own behalf, as your continuous and frequent reports to us of all places where human lives are at stake will result in our inspectors visiting such places and having improvements made. You understand that our inspectors not only are required to look after fire escapes and exits, but also fire-fighting apparatus, the elimination of inflammable materials, etc. Thus, when one of our inspectors goes to a building, he not only carries out the requirements of the law to protect the workers, but at the same time does a very great work in reducing the hazards of fire.

"I am writing this with great earnestness and hope that you will take it up immediately for the purpose of having your people all through the State at once put us in contact with every place where the fire hazards are great and the danger of human lives serious. I shall be interested to hear from you on this matter."

Frame Dwellings in the South

Frame dwellings in the South have long proven unprofitable to the fire insurance companies, despite the 25 per cent rate advance thereon applied about four years ago. While exact returns for 1915 are not yet available, it is generally agreed by underwriters that the class, "especially those with wood shingle roofs," will show as high a loss ratio as in former years.

SAFE HOMES

A DEPARTMENT OF "CONSTRVCTION"

Devoted Exclusively to the Interest of the Home Builder

Edited by Ralph P. Stoddard

BUILDING education was the paramount feature of the First American Complete Building Show held in Cleveland, February 16-26. A pronounced uplift in building ideals will be the direct result. Not only better and more attractive, but safer homes will feature the next year's building operations in the Sixth City.

The show was advertised as "a ten-days' college course for the man about to build." It was more than that. Very considerably more. It was the experience of a lifetime cunningly assembled and displayed, with the most approved methods of construction, the most modern equipment, the most artistic finish, and the art of furnishment all brought down to the point of greatest utility and set attractively under the spotlight for the public benefit.

Thousands of home-owners left the Coliseum with accurate understanding for the first time of just how far short of real efficiency they had fallen in the building of their homes. Other thousands of prospective home builders carried away with them pointers which will be taken advantage of and which will add hundreds of dollars to the real value and comfort of their homes-to-be. For educationally the show was really complete.

The homes which most of us were used to in our youthful days were just about as far short of the present-day ideal home as Darius Green's flying machine was short of the latest perfected German fokker, admitedly the premier man-of-war of the sky lanes. In every city in the country to-day are houses by the hundreds which represent the cast-out ideals of bygone ages. And what is worse, they are yet being built along these same lines.

But a new day is dawning for Cleveland home building. It will dawn for other cities just as soon as equally complete building shows are offered for the public entertainment and education. The man who possesses sufficient ability to garner enough dollars to build himself a dwelling place may safely be counted upon to display an equal comprehension of what goes to make a safe and sane modern home, once he has interestedly inspected such an exhibition as the Cleveland show.

Perhaps one of the most significant developments of the event was the award of the prize $500 for the best plan of a house guaranteed to be possible of building for $3,000. More than 300 house plans were submitted by architects. They came from all sections —from the Atlantic to the Pacific Coast, from the Lakes to the Gulf. They represented all styles and materials.

But the house that took first prize, impartially selected by a committee of disinterested architects, was a fire-resistent structure, to be built of hollow tile finished with stucco and roofed with slate!

It has long been the contention of the advocates of frame building that an attractive and modernly equipped house of any clay product could not be built for any such price. In fact, it has been persistently declared that existing prices of clay products were prohibitive for the man of moderate means. And to a large extent this impression yet exists in the public mind.

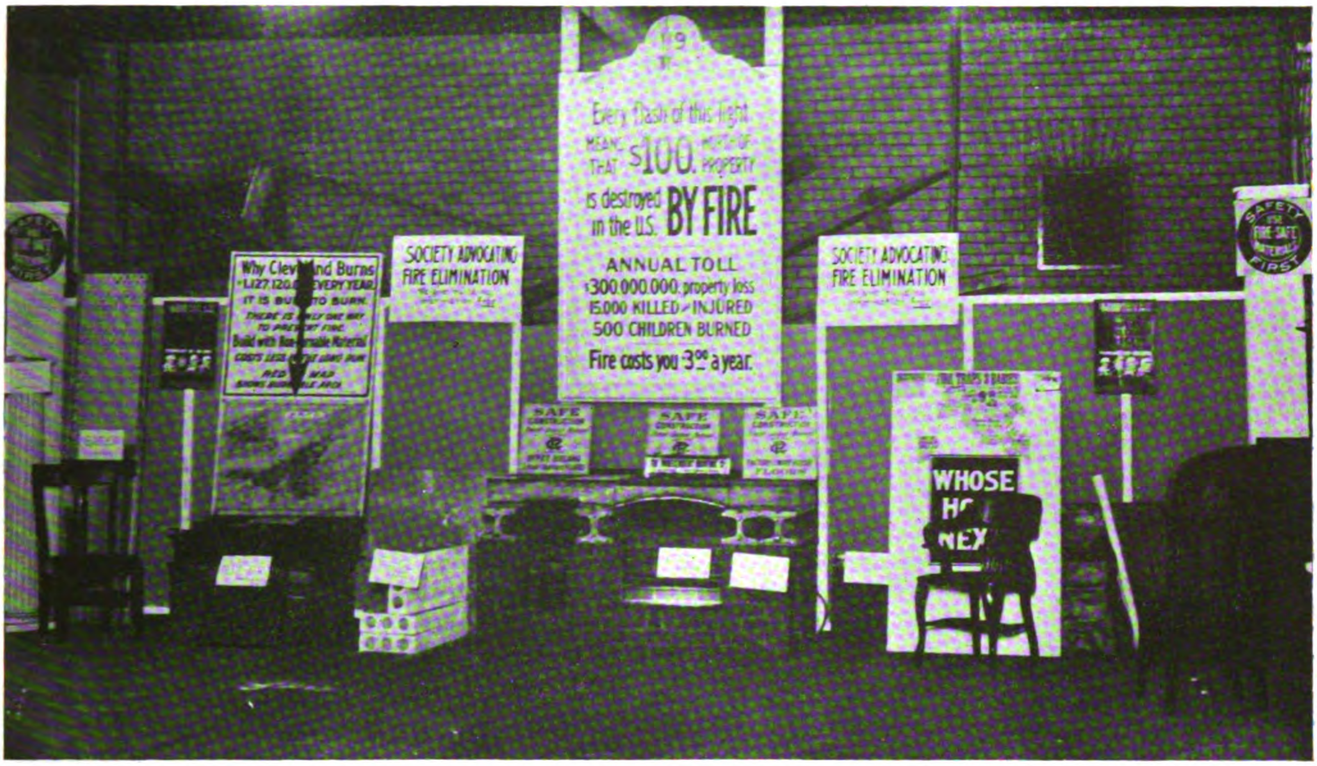
This incident would seem effectively to refute it. For the estimates were checked over with exceeding care; it was determined beyond possible question that the house could be built for the amount named—in fact, no award was made upon any plan which upon careful and complete checking up was found to run beyond that figure in actual cost.

The keenest interest was displayed in this plan. It was a revelation in a way, for it knocked the popular impressions galley west. And it was a distinctly emphatic boost for the use of fire-resistive materials.

What is happening in Cleveland is in dircet line with the history of clay product shows in Chicago. These have been held at intervals there for a number of years past. The result is that Chicago, due entirely to their

(Continued on page 125)

SAFE HOMES EXHIBIT


Every flash of this light
MEANS THAT $100. WORTH OF PROPERTY
is destroyed in the U.S. BY FIRE
ANNUAL TOLL
$300,000,000 property loss
15,000 KILLED - INJURED
500 CHILDREN BURNED
Fire costs you 3¢ a year
SOCIETY ADVOCATING FIRE ELIMINATION
SOCIETY ADVOCATING FIRE ELIMINATION
Why Cleveland Burns
SAFETY FIRST
SAFETY FIRST
WHOSE

REACHING THE PUBLIC

The photograph above illustrates one of the many means The S-A-F-E is every day using to carry out its programme of public education to the economy of Safety First in building.

This booth was maintained by The Safe in the Safety Exposition held last month in Cleveland under the auspices of the Industrial Commission of the State of Ohio. The visits of Governor Willis, of Ohio, and of President Wilson to Cleveland attracted thousands to the downtown districts and helped to give this show a record attendance.

The space was taken by The Safe and all members invited to send in exhibits of their products. In this way an exceptionally representative display of Safe building materials was gathered together. These were tagged with signs describing their use, thus making each exhibit self-explanatory, although one of The Safe staff was on hand to answer questions and expound the gospel of safety building.

Above the large sign in the center was hung a 500-watt nitrogen lamp, timed to flash every ten seconds, thus indicating a loss of $100.00 by fire throughout the country. This unique device attracted thousands to the booth, where other signs, materials and literature combined to "put over" The Safe idea.

As an indication of the interest of the public in general, it may be stated that more than 10,000 pieces of Safe literature were taken by visitors. This matter was not handed out promiscuously, but was so placed that it had to be taken by the persons themselves. In this way a true idea was gained of the great number of persons interested in Safe homes.

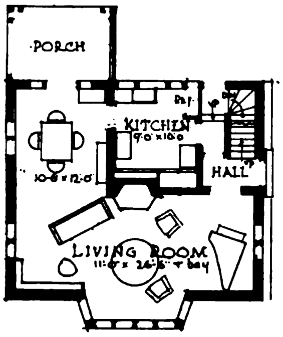
Of the literature distributed, more than 1,000 were copies of CONSTRVCTION.

* * *

It has been the history of mankind throughout the ages that in order to create public sentiment, a sentiment that is lasting and of importance, you must first have a principle for which the people can stand, a principle with a definite meaning; secondly, you must carry this message home to them.

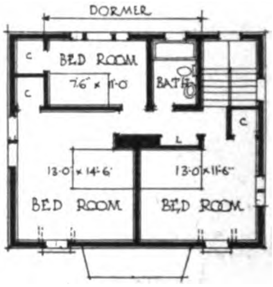
There must be built up against flimsy construction a solid wall of public sentiment. You must carry this message home to the people and teach them the value of your product. By moving forward in a compact organization of this kind you will accomplish great things for the increase of your trade.

PRIZE HOUSES AT COMPLETE BUILDING SHOW



Plans and elevations of the seven best designs submitted in the Cleveland Art Association's competition in connection with the Complete Building Show at Cleveland, Ohio, February 16 to 26 1916.

ALL HOUSES DESIGNED TO COST $3000.



SECOND FLOOR

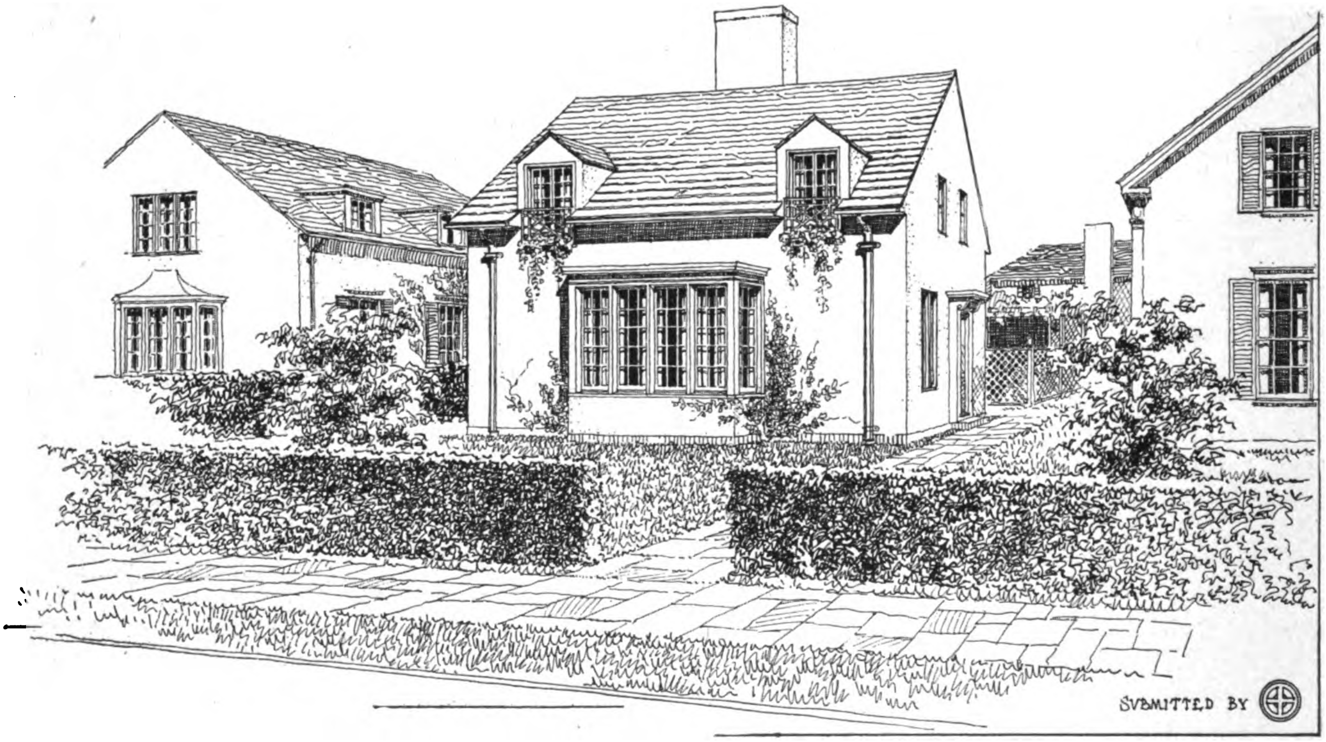
THE lesson learned from the more than three hundred drawings submitted in the Cleveland Art Association's architectural competition, which was conducted in connection with the Complete Building Show, is that architects the country over favor the use of firesafe materials.

A great majority of all the drawings submitted in this contest employed stucco or other fire-resisting materials for exterior finish. More uncertainty exists in the roofs, but the conventional methods of indicating slate and tile leads to the conclusion that firesafe coverings also are popular with the designers.

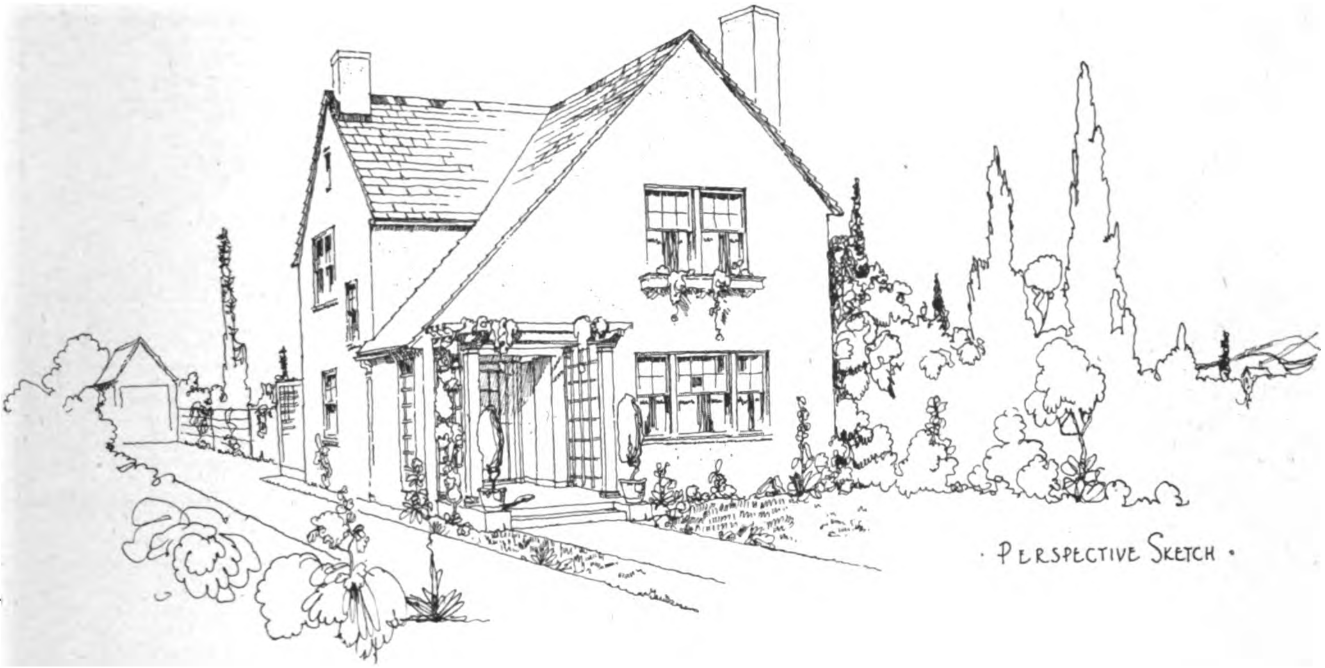
No material restrictions were placed upon the contest, the designers being given a free hand in their selection. Neither was any preference shown by the jury in selecting the prize designs, the design itself being the only consideration.

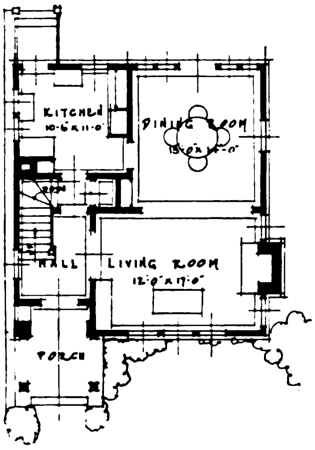
In spite of this, only one of the prize designs is of lumber.

The fact the contest drew designs from all parts of the country, from New Hampshire to California, is taken as fair indication of the sentiment among



FIRST PRIZE—Design by Olaf William Shelgren, *Architect*, Buffalo, N. Y.



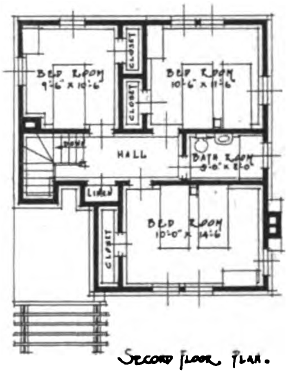


SECOND PRIZE HOUSE

By

S. C. Merrell and C. H. Dittmer

Architects, Cleveland, Ohio



those of the architectural profession toward more permanent materials, those which will serve to perpetuate their products for more than average short life of the present-day house.

First Prize Design

From about three hundred designs submitted, that of Olaf William Shelgren was chosen as the first prize winner.

The palm thus goes to Buffalo, Shelgren being a member of the Buffalo Architectural Club and identified with the office of Robert North, 1314 Prudential Building. He is prominently identified with the architectural life of Buffalo and is president of the Sketch Club, composed of architects of that city. The Bison City has many beautiful examples of Shelgren's work.

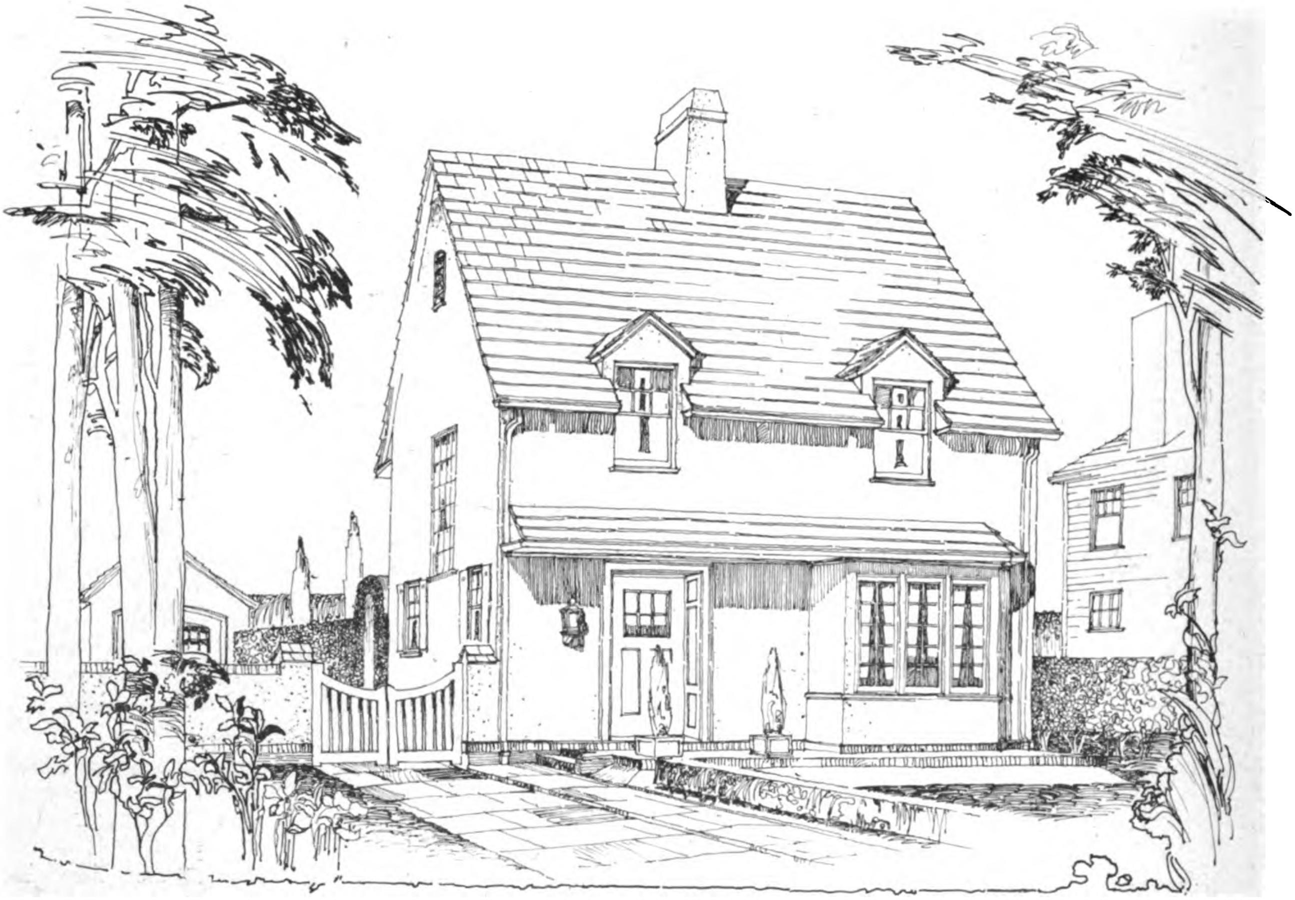
"We selected Mr. Shelgren's design in preference to all others," said Chairman Charles S. Schneider, of the committee, "because, after an exhaustive study of the merits of each, we decided his best met the requirements of the contest from every point of view."

The first prize house is indeed a model of compactness. There is scarcely a single inch of space wasted; yet provision is made for every necessity of a home of its size.

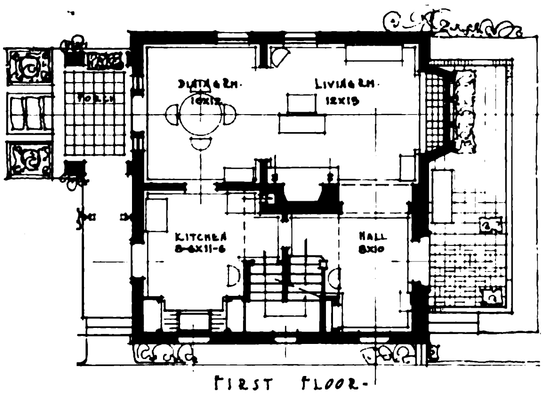
The feature of the house is, of course, the elimination of the entrance from the front of the house and the substitution of a large bay window, opening on three sides instead of the conventional porch. The ventilation of the big living room will make it livable the year round, providing a cool room in summer and an exceptionally light one for the long winter months.

The dining room is a part, really, of the living room, making both available as one room in case of need. French doors open onto the porch, which, with the garden laid out artistically, as indicated, will make an admirable outdoor lounging place.

The kitchen contains all the necessities of the culin-



THIRD PRIZE HOUSE—By H. W. Peebles and R. W. Hazlewood, Detroit, Mich.



FIRST FLOOR

ary department. The stair arrangement provides an excellent short-cut from the working section of the house to the second story.

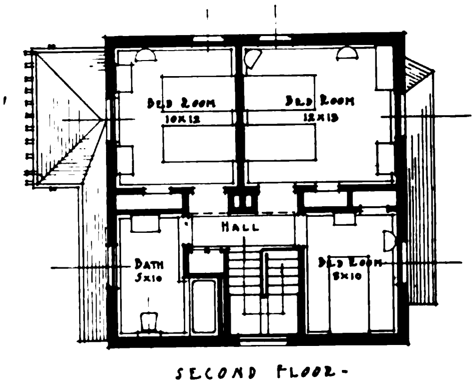
The bed rooms are well laid out, providing a large family room, a good-sized guest room and a small room for children. Each contains good closet space, with a linen closet in the hall.

The first prize house is of stucco, with a roof of green slate. The window and door frames are green, to blend with the roof. This color scheme will blend with any natural scenery which may surround the house and combine to make a perfect picture of an artistic home.

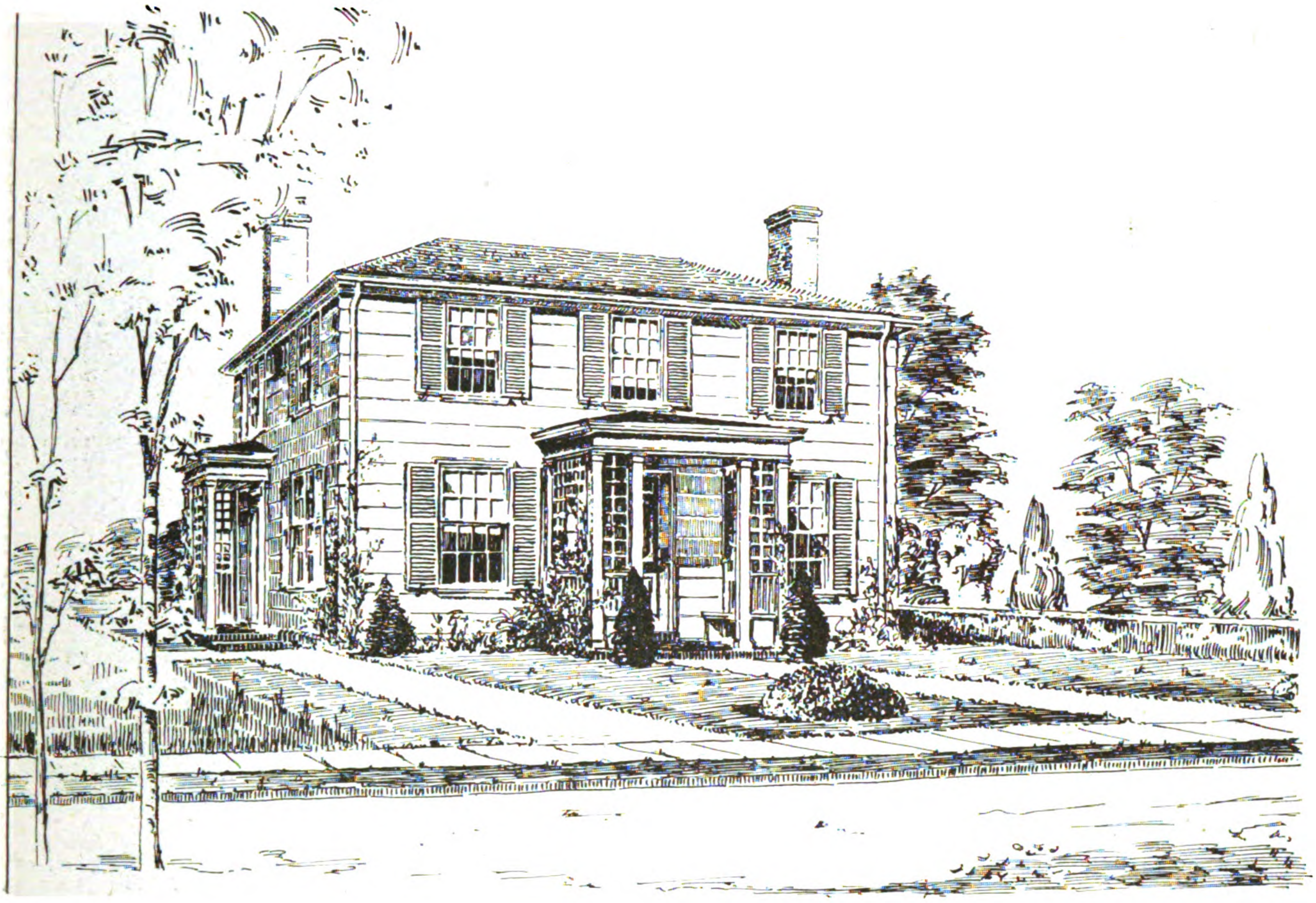
Second Prize Design

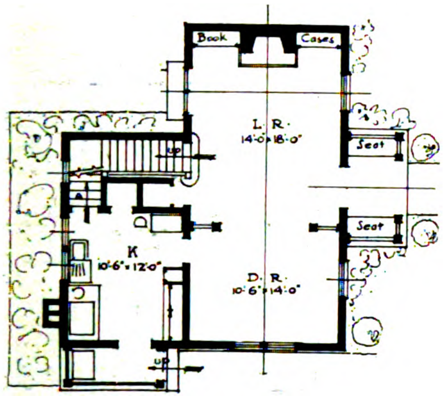
Two Cleveland boys, S. C. Merrell and C. H. Dittmer, captured the second honors. They are of Charles S. Schneider's staff and both are well known to the Cleveland fraternity.

They chose stucco as their medium and produced a very beautiful little home for a small family. The recessed porch, for privacy, and the excellent arrangement of stairs are features of the first floor plan. The dining room is exceptionally large and well arranged for



SECOND FLOOR





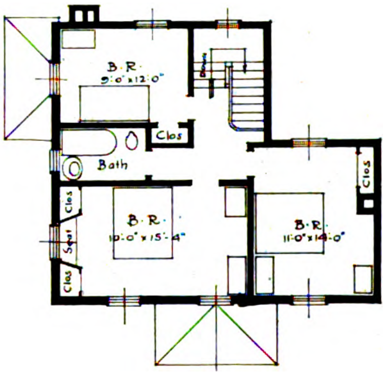
FOURTH PRIZE HOUSE

By

Frederick J. Harburg

Architect

New York City



the necessary furniture. The arrangement of the kitchen leaves little to be demanded in point of convenience.

The large family bed room and exceptionally ample linen closet are the features of a very good second story arrangement.

With an arrangement of grounds, as shown in the drawing, this little home would be a credit to any community.

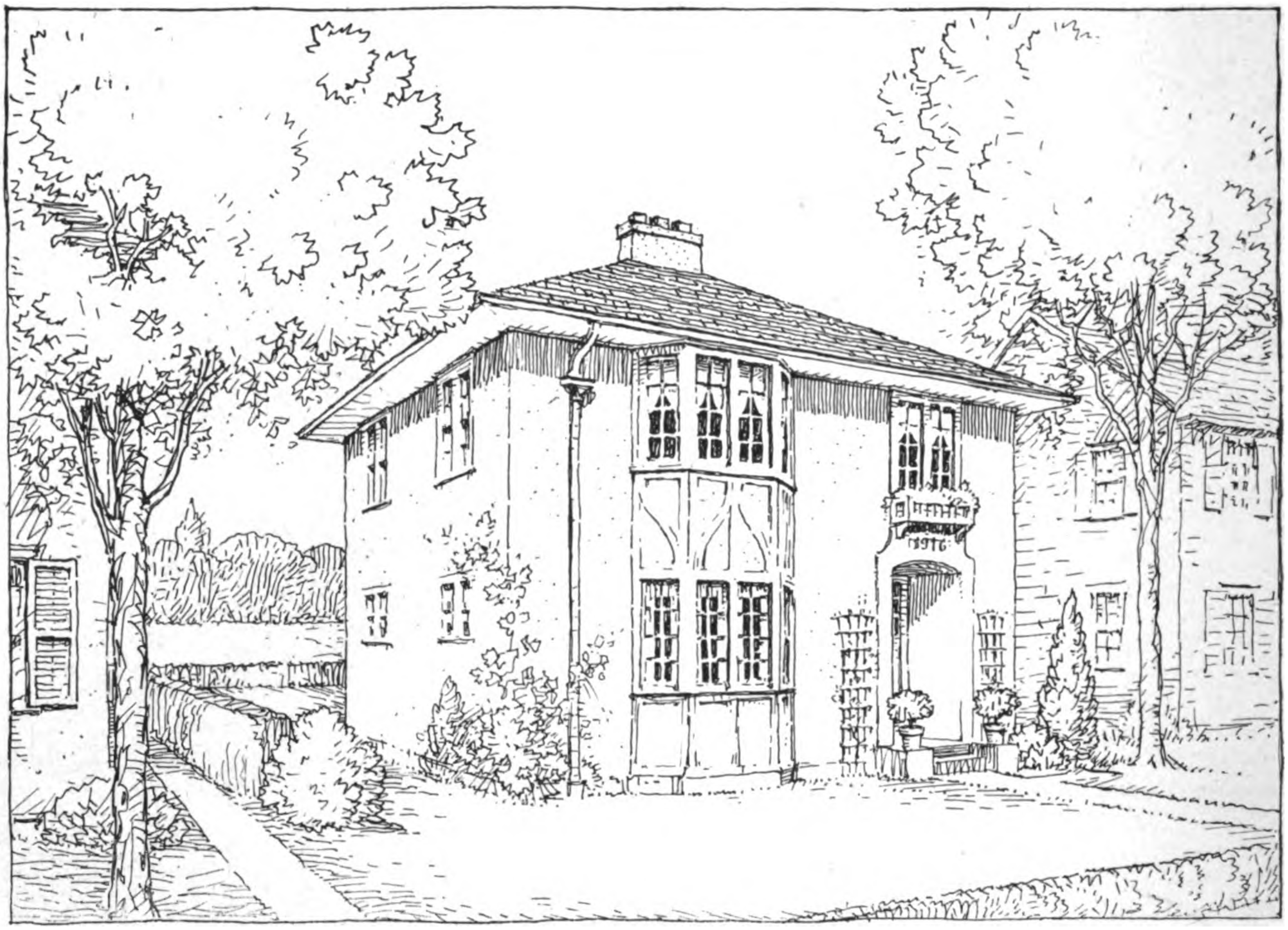
Third Prize Design

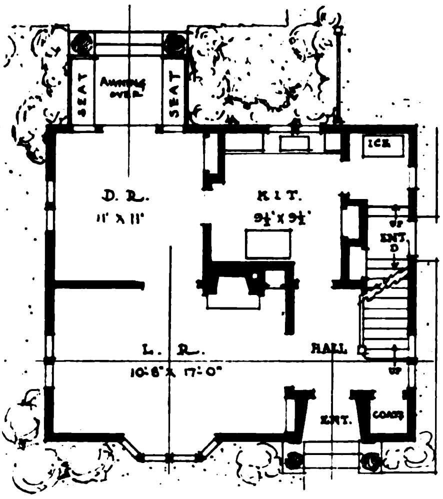
Third honors fall to two Detroiters, H. W. Peebles and Richard W. Hazlewood, of 82 N. Elizabeth street, who present a very original design as their notion of what constitutes a model home for $3,000.

The paved terrace across the front, with its narrow suspended covering, its big bay window and steep roof give a suggestion of a quaint old type, modernized for present-day use.

The large hall, with the combined stairway, under which access is gained to the kitchen, are features of a good floor layout. Two large bedrooms and one small one for the maid or for use as a nursery distinguish the sleeping portion.

The garden is well arranged to give a sightly view



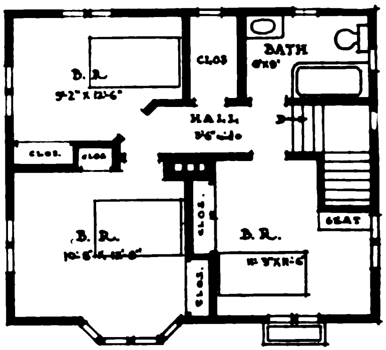


FIFTH PRIZE HOUSE

By

C. C. Tallman, *Architect*

Auburn, N. Y.



SECOND FLOOR PLAN

from the porch, which opens off the dining room.

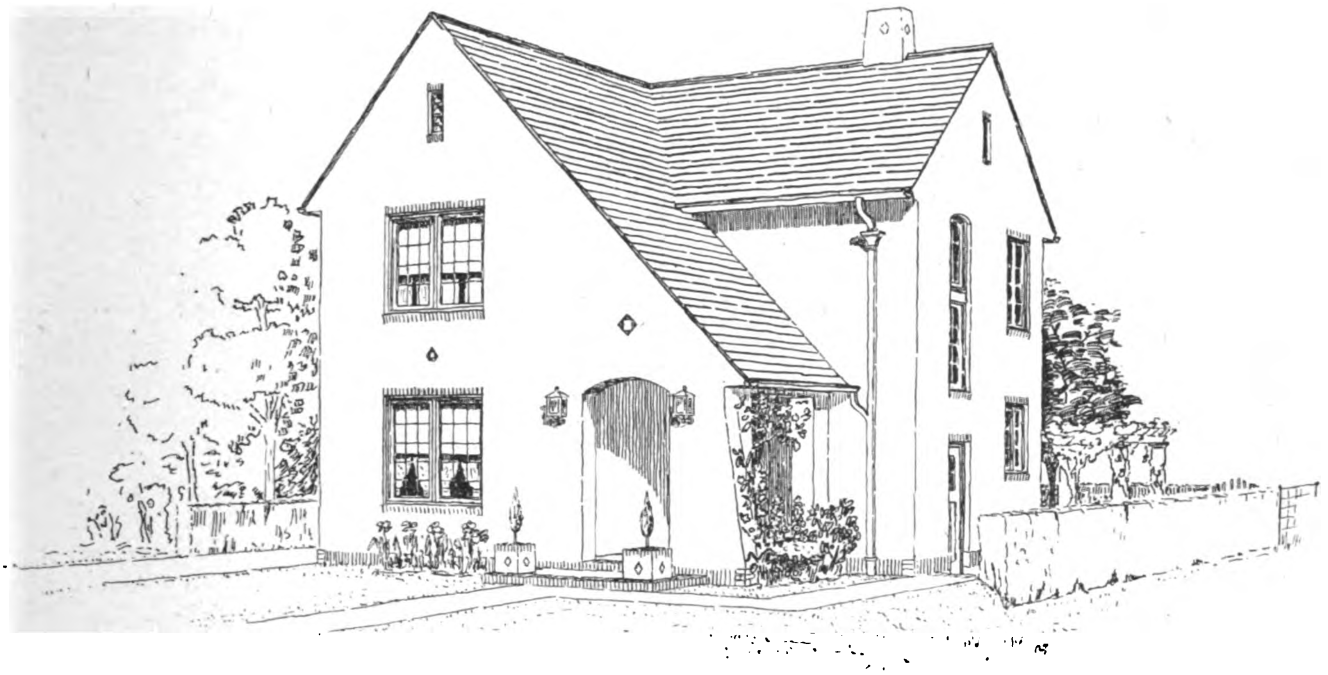
This house lends itself readily to the use of stucco, with dark roof and window trim, as shown.

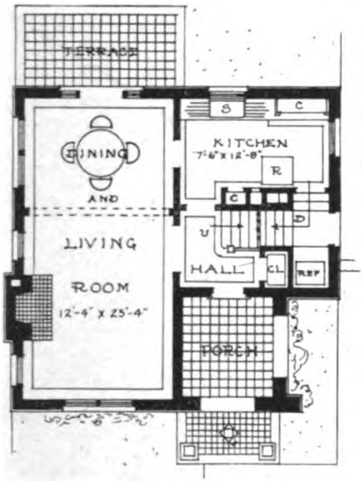
Fourth Prize Design

New York City claims fourth prize. This design is by Frederick J. Harburg, 94 West 162d street. He chose a Colonial type and evolved a very beautiful and livable home. His drawing shows excellent use of wide lap siding, which is growing in popularity. The large kitchen and living room meet demands of present-day home builders, while the stairways are arranged to give the maximum of utility. The cross ventilation obtained in many of the rooms is an excellent point.

Pustairs a good-sized family bedroom has been provided, with ample closet space for all average needs. The other chambers are well lighted and, with the ample windows, should be cool in the hottest weather.

The arrangement of the grounds of this house is





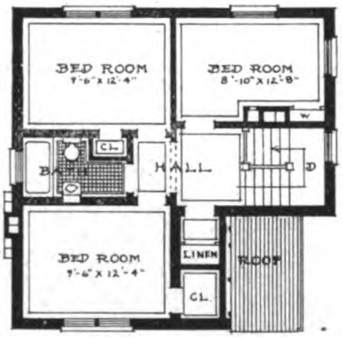
SIXTH PRIZE HOUSE

By

Henry P. Whitworth

Architect

Cleveland, Ohio



worthy of study and faithful execution in building the house. The separate walks leading to the porch and the path stretching from the French doors in the living room through the garden provide a pretty vista.

Fifth Prize Design

Stucco on metal lath was chosen as the construction materials of the fifth prize design, which is by C. C. Tallman, 17 Dill street, Auburn, N. Y., whose product shows many originalities.

The bay extending from ground to roof is the predominent note of this little house's exterior. Inside a roomy living room with an inviting open fireplace suggest a home-like abode. The large cold-room off the kitchen will please the lady-of-the-house.

Despite the fact two large bed rooms are provided for, there is still ample room for a storage closet of ample size.

The little entry provides room for a couple of chairs, while the rear porch insures a lounging place for quite a party.

Sixth Prize Design

Living and dining rooms are practically one in the plans of Henry P. Whitworth, 155 Carlyon Road, Cleveland, who captured the sixth prize. His house is of the cottage type and presents a beautiful exterior.

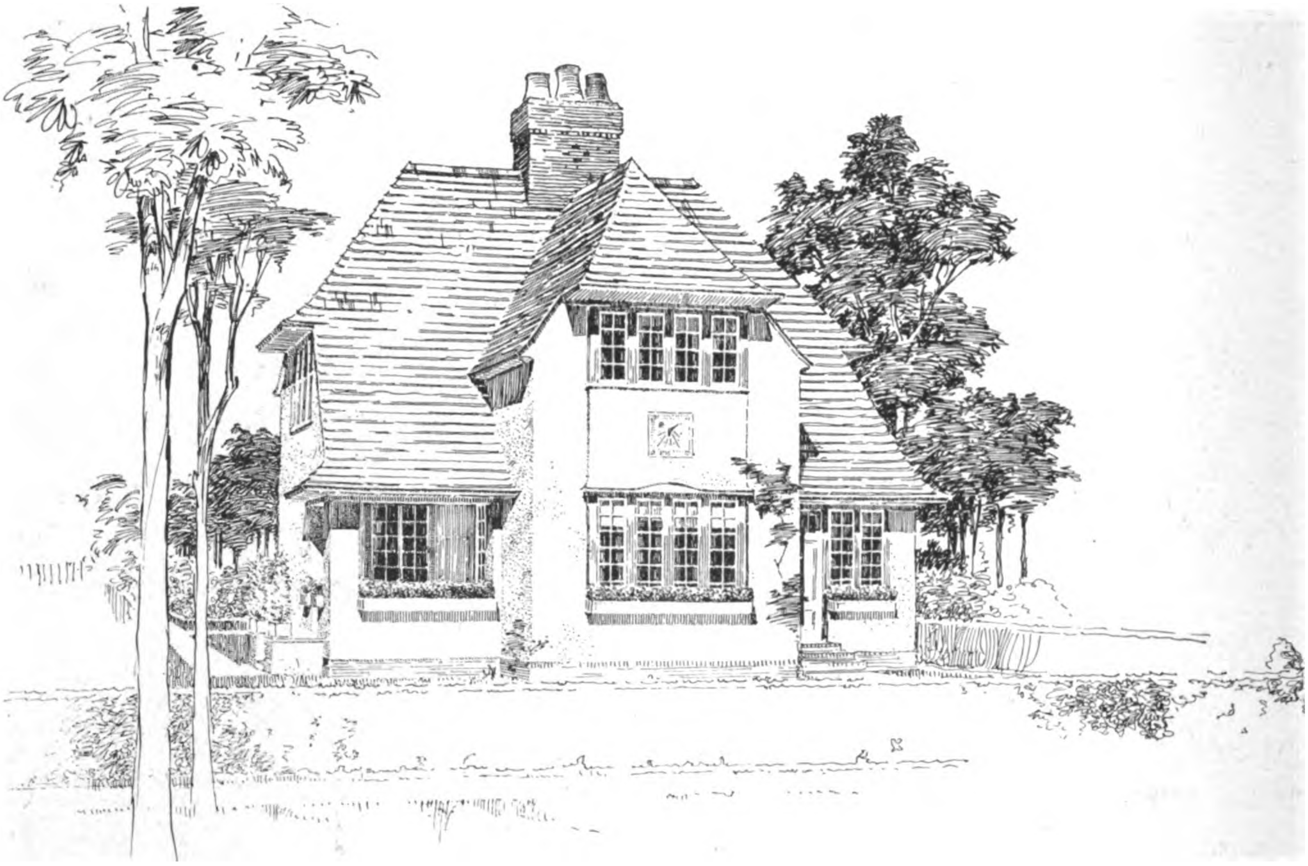
Within, the open effect of the downstairs arrangement of this house gives the impression of a very much larger house than it actually is. The combined stair and entrance hall, with direct passage to the kitchen, show excellent use of the limited space available.

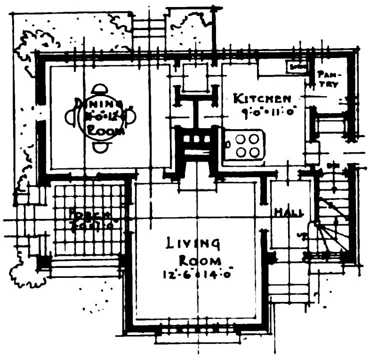
A careful arrangement of the second story has resulted in three chambers, all of good size, with a conveniently arranged bath.

Hollow tile are specified as building materials.

Seventh Prize Design

Maurice Feather, 129 Langdon avenue, Watertown.



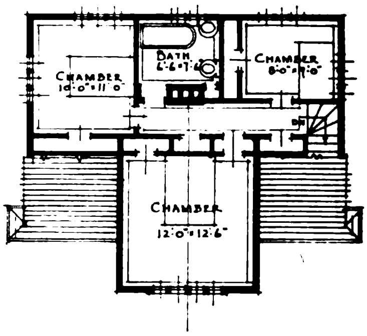


SEVENTH PRIZE HOUSE

By

Maurice Feather, *Architect*

Watertown, Mass.



Mass., who obtained the seventh prize, has evolved a house of exceptionally interesting exterior. The placing of the enclosed porch and entrance upon opposite sides of a front wing, the rather steep roofs and the single large chimney placed in the center of the building give it the effect of bigness, which is a feature of this interesting design.,

The interior arrangement is good from every point of view, and the rooms, both downstairs and up, are large and well lighted and ventilated.

This architect also chose stucco for his exterior finish.

Other Designs

The judges were favorably impressed with the other drawings shown. In fact, say the judges, it was difficult to pick the winners and those for special mention from among more than fifty selected for consideration. They all embody many excellent features, which make them "different" from the average home.

An effort is being made to create the Bureau of Fire Inspection as a branch of the New Jersey State Department of Labor.

West Hoboken, N. J., plans a municipal hall, in which among other departments of activity the fire alarm service will be housed.

WEATHER:
Always warm in winter and cool in summer if you are in a firesafe home, office or factory building.

The Fireproofing News

CONTAINING DETAILED DESCRIPTIONS OF NEW DEVICES AND APPLICATIONS OF MATERIALS WHICH ARE OF REAL VALUE IN FIRESAFE BUILDING: ALSO NOTES ON THE LATEST BOOKLETS, CATALOGS AND OTHER FIRESAFE LITERATURE, WITH OTHER ITEMS OF INTEREST TO THE FIREPROOFING FRATERNITY

LATEST EDITION

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New York City, N. Y., February, 1916

Priceless

HOLLOW BUILDING TILE MANUFACTURERS MEET

Progressive Association Holds Interesting Convention at New York City

The Hollow Building Tile Manufacturers' Association of America, with headquarters in the Engineers' Building, at Cleveland, Ohio, held their annual convention, beginning January 25th, in the Hotel Claridge at New York City.

Secretary Charles T. Harris is to be congratulated on the progress achieved during the past year, and the members of the Association deserve praise for their foresight, which has resulted in a constructive program for the coming months, having as one noteworthy object the standardization of the use of hollow tile in building construction.

A new committee of the American Society for Testing Materials has been formed for the purpose of determining proper tests for hollow building tile, and arrangements have been made for extensive tests of the material in its various forms from the different clay fields of the country.

Tile for floors, walls, partitions, and the fireproofing of metal structural members will be tested for fire-resistance, conductivity, compression and absorption. The Ohio field has been chosen to start the work, and samples of tile made by members in that section from the different clay beds located there will be submitted. These will be followed by tests of Eastern and Far Western products.

This constitutes a splendid advance step for furthering the interests of the structural terra cotta manufacturers. The industry today stands greatly in need of standard specifications and official knowledge of the product, which may be spread broadcast through the building fraternity for the purpose of proving the merits of hollow tile when properly manufactured and used.

The wise manufacturer who is not already a member of this Association will lose no time in affiliating himself with the H.B.T.M.A., in order to benefit from the excellent work which it is doing for the industry. It is self-evident that when this work is accomplished, membership in the Association will constitute a guarantee of standard quality of products, and, while the expense at present is slight, those who will desire to come in after the good work has been done will have lost the chance and the advantages of ground-floor membership.

Secretary Charles T. Harris

It would seem that an admirable method of procedure is being followed out by the careful collection and collation of data regarding hollow building tile and the planning and carrying out of proper tests. This reliable information, which can be presented to the building public and the makers of building laws and codes, is greatly to be desired and must result in a marked increased use of the product.

The convention spirit may be characterized as that of "progress based on co-operation," and that good will which generally permeates concerted action was noticeably present. Mr. Harris was fortunate in having present, among others, such well-known speakers as Rudolph P. Miller, who after some twenty months of labor has just completed the New York City Building Code, and S. G. Webb, secretary of the Gypsum Industries Association.

Mr. Miller spoke of his work on the recently finished building code, which constitutes an article in the present number of CONSTRVCTION, and Mr. Webb presented as his subject "The Higher Competition." The keynote of both speeches was "co-operation," and both speakers brought out in admirable manner the utter foolishness and tremendous waste of energy shown when men engaged in one industry and having in mind one common purpose lose time and money in internal friction and fighting, when, by combining their strength and exerting their efforts towards the attainment of such laudable ends as each desires, one and all benefit in bringing the common aim and purpose to quicker realization.

The following members were present:

H. F. Banfield, president of the Banfield Clay Co., Irondale, Ohio; H. H. Camp, president of the Camp Conduit Co., Cleveland, Ohio; H. S. Renkert, general manager of the Metropolitan Paving Brick Co., Canton, Ohio; H. C. Downer, president of the Malvern Fire Clay Co., Malvern, Ohio; W. J. Burke, general manager American Clay Products Co., New York City; J. J. Whitacre, vice-president Whitacre Fireproofing Co., Waynesburg, Ohio; H. H. Titsworth, president The Clay Products Co., Indianapolis, Ind.; R. W. Allison, vice-president and general manager of sales, The National Fire Proofing Co., Pittsburgh, Pa., and J. A. Maahs, general manager The Pennsylvania Fireproofing Co., Erie, Pa.

In addition to the above, there

were present several visiting manufacturers of hollow tile and a number of others from member companies.

The morning session was given up to reports of committees, financial statement of the past year's work and expenditures and a budget for the coming year. Following the afternoon program, there was an election of the Executive Committee, which has in charge the work of the Association for the year 1916, as follows: R. W. Allison, representing the National Fire Proofing Co.; R. E. Whitacre, representing the Whitacre Fireproofing Co.; J. A. Maahs, representing the Pennsylvania Fireproofing Co.; R. E. Greer, representing the Greer-Beatty Clay Co.; H. H. Titsworth, representing the Clay Products Co.; B. C. Keeler, representing the Mason City Brick & Tile Co., and W. G. Demarest, representing the Raritan Clay Products Company.

LUMBER RECOGNIZES REAL FIREPROOFING

The International Mill & Timber Company, Bay City, Mich., well-known manufacturers of "Sterling Homes," has recently taken possession of its new fireproof hollow-tile, brick-faced office building, which covers an area of 100 x 100 feet in size and is located next door to the mills of the company.

SPRINKLERS AND SAFE SCHOOLS

The current number of the *Automatic Sprinkler Diffuser* is devoted wholly to schools, and after mentioning recent fires in such buildings cites a number of fire chiefs, school superintendents, boards, and other authorities who most heartily bemoan the various disasters and in their strong indorsement of sprinklers say, that ***"if"*** such structures had been equipped with this practical device, they would to-day be serving their communities and safeguarding the lives of its children. Statistics show that schools and colleges burn up faster than flour mills, packing establishments, textile mills, furniture manufactories and many other industrial buildings which fire insurance companies consider more than ordinarily hazardous. Still schools and colleges are not ranked among the "special hazards," which is a classification merited by their fire record.

In a period of six years, schools and colleges were number thirteen in the list of rapidly burning classes; flour mills, number fifteen; packing establishments, number seventeen; textile mills, number eighteen; furniture manufactories, number twenty. Considering the lesser rate of burning, all of them are safer places than schools. In answer to the natural query as to why the public does not hear more of such catastrophes, the *Diffuser* offers the logical reply that since the Collinwood fire, where 170 little children and teachers were incinerated, and excepting that of Peabody, which resulted in the death of 21 little girls, 85 per cent of such blazes have taken place when classes were not in session.

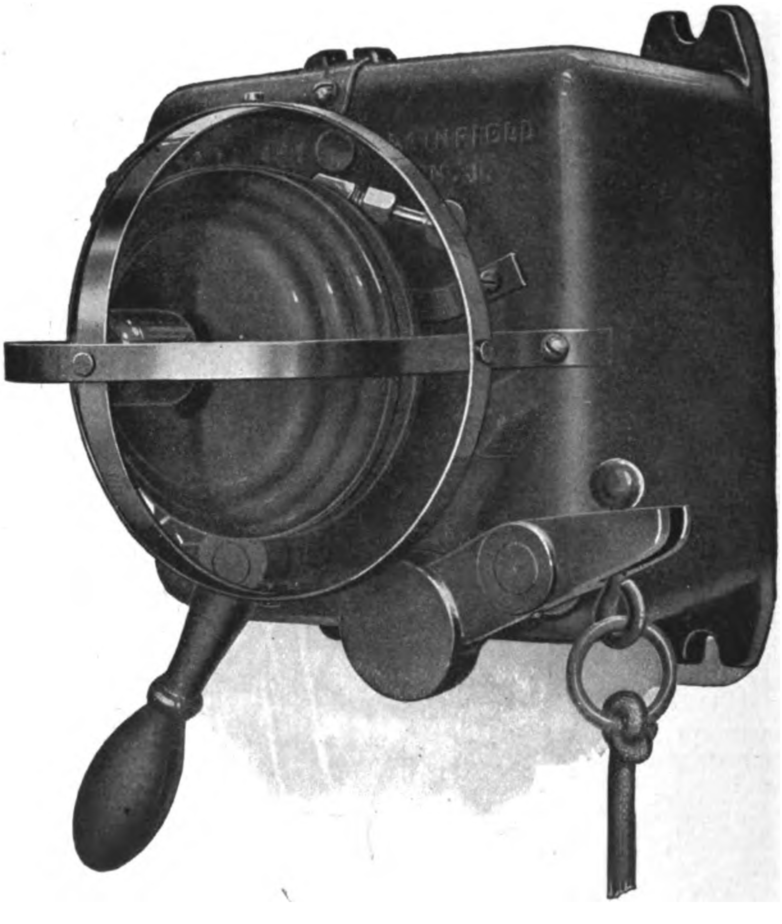
During 1915, 260 school and college buildings burned, at a loss amounting to $5,400,000!

AUTOMATIC FIRE DOOR RELEASE

The necessity for a more rapid and dependable "automatic" device for the operation of fire doors, and the knowledge that the methods heretofore employed were antiquated in the function of detecting fire, led to the invention of the "Automatic" Fire Door Release, a very simple, clever and substantial device operated by what is known as the "rate of rise" in atmospheric changes.

Air, being most sensitive to changes of temperature, was chosen as the medium for operating the new device. Air is constant, absolutely dependable, and will expand or contract instantly, and without lag, approximately one four-hundredth of its volume for each rise or fall of one degree Fahrenheit. A rapid rise of temperature accompanies every fire and it is this "rate of rise" that operates the "Automatic" Fire Door Release.

Temperature is ever changing up

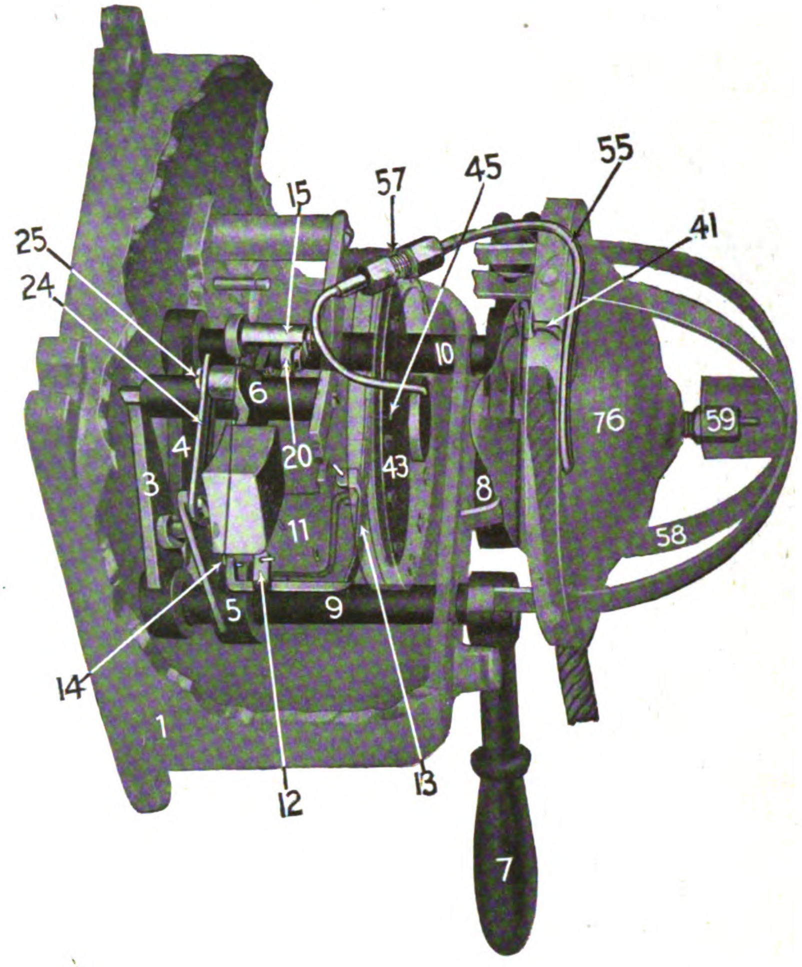


or down. The rate of change varies under different conditions. For all local conditions influenced by such as lighting, heating and various manufacturing processes, wherein heat is employed, there is a readily determined maximum of "rate of rise."

But the "rate of rise" caused by the occurrence of a fire is many times greater than that caused by any normal condition. The "Automatic" Fire Door Release is not affected by the normal changes of atmosphere—it is self-compensating, which is to say that it automatically adjusts itself to all normal changes of temperature.

The difference between the normal "rates of rise" is what causes the device to operate; for the initial temperature has not the slightest effect upon the device, because it works only when *the temperature rises faster than the rate at which it is set, and for which it compensates.*

The action of the release in the event of fire is as follows: The rapid rise of temperature causes an immediate expansion of air in the air chamber, which acts upon the mechanism within the case, causing the weight release lever to trip, the cord to pass freely through the pulley of the door weight, allowing the door to close. The release operates when the rate of temperature increase is abnormal, as under fire conditions, or at the rate of 15 degrees or more per minute. This minimum rate of 15 degrees was approved as the result of years of public service. The release can be readily applied to any fire door, shutter or other fire stop or emergency control. By its quickness and positive action it offers assured protection from spread of fire through fire wall openings. Proper tests have proven that this device will release a fire stop from an incipient fire 25 feet distant in less than one minute.



When a rise of temperature equal to 15 degrees or more within one minute occurs, the air in Air Chamber No. 76 expands, exerting pressure on Diaphragm No. 43 through Air Tubing No. 55, pushing out Diaphragm Punger No. 45. This movement of plunger disengages Leverage System Nos. 13, 12, 14 and 15, allowing operating Lever Shaft No. 6 to rotate in response to weighted end of same, disengaging Leverage System Nos. 3 and 4 and Release Operating Lever Shaft No. 10, which releases Cord Ring No. 41, to which fire opening control is attached.

To Reset

After the release has been operated, wait a few moments for the air in the Air Chamber No. 76 to equalize with the atmosphere by means of Compensating Vent No. 59. Then if Reset Hand Lever No. 7 be raised the Reset Shaft No. 9 and Locking Lever No. 3, which are attached, are thrown into engaged position. Drop Reset Hand Lever No. 7 to its normal position and Cord Ring No. 41 can then be placed in the fork of weighted Release Lever No. 8.

Compensating Feature

The air in Air Chamber No. 76 is kept at atmospheric pressure under local changes of temperature through the medium of Compensating Vent No. 59, which is calibrated to permit rise in temperature of less than 15 degrees per minute to occur without producing pressure enough in Diaphragm No. 43 to move Plunger No. 45. When rise in temperature of 15 degrees or more per minute takes place, then the pressure in Diaphragm No. 43 builds up beyond relief capacity of Compensating Vent No. 59, causing release to operate as above described.

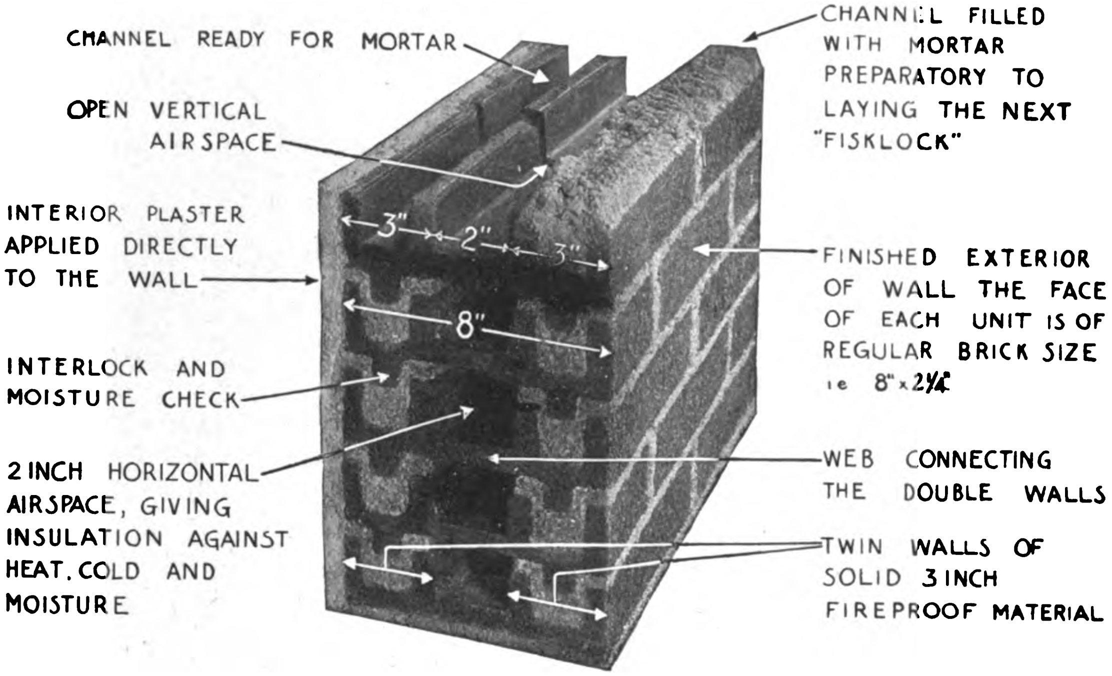
The "Automatic" Fire Door Release is put out by the "Automatic" Sprinkler Company of America, with executive offices at 123 William Street, New York, and has received the approval of the Underwriters' Laboratories, the Department of Labor, State of New York, Department of Labor, State of New Jersey, and the Fire Department of the city of New York.

The Fireproofing News

"FISKLOCK"-"TAPESTRY" BRICK

Hardoncourt—Fiske Patents

Fiske & Company, Inc., of New York and Boston, the concern which put "Tapestry" brick on the national map has recently brought out an ingenious and highly practical innovation in brick to which they have given the trade-marked name of "Fisklock."


CHANNEL READY FOR MORTAR
OPEN VERTICAL AIR SPACE
INTERIOR PLASTER APPLIED DIRECTLY TO THE WALL
INTERLOCK AND MOISTURE CHECK
2 INCH HORIZONTAL AIRSPACE, GIVING INSULATION AGAINST HEAT, COLD AND MOISTURE
3"
2"
3"
8"
CHANNEL FILLED WITH MORTAR PREPARATORY TO LAYING THE NEXT "FISKLOCK"
FINISHED EXTERIOR OF WALL THE FACE OF EACH UNIT IS OF REGULAR BRICK SIZE i.e 8"x2¼"
WEB CONNECTING THE DOUBLE WALLS
TWIN WALLS OF SOLID 3 INCH FIREPROOF MATERIAL

"Fisklock"-"Tapestry" brick is not hollow tile—it is an interlocking channel brick, the invention of Arthur Hardoncourt, Jr., chief engineer of Fiske & Company, Inc. Its construction provides a double, hollow wall with a brick face, consisting of two solid masonry walls each of three inches thickness. These double walls are separated by a two-inch air space, but bound inseparably together by webs made integral with the brick itself, thus making every brick both a "header" and a "stretcher," permitting the erection of corners, window jambs, arches, belt courses, ornamental panels, etc., etc., with solid "Tapestry" brick of the same color. "Fisklock" walls have nearly twice the strength of solid walls constructed of common brick. A most unique feature possessed by this late originality in the Fiske products is its absolute imperviousness to dampness, as it is a well-known fact that moisture traverses a brick wall through the mortar joints, which are porous. "Fisklock" itself has no continuous mortar joints through the wall, either horizontally or vertically. There is no possibility of moisture "striking through." Where solid "Tapestry" brick is used around windows, doors, etc., a small amount of waterproofing on the inside of the solid brickwork is desirable because of the "through" mortar joints at these points. The solid double walls in "Fisklock" construction, separated by closed air cells, provide maximum heat cold insulation. These air cells are horizontal and eliminate internal air circulation caused by the up-and-down drafts which are common within most hollow walls. Tests made by the engineers of Columbia University show that the heat transmission through "Fisklock" walls is considerably less than that which permeates through walls of solid brick, and the saving in heating bills is therefore increased. Because of these remarkable heat-insulating qualities a "Fisklock" house is made warmer in winter and cooler during the summer months. Another feature wrought by "Fisklock" brick is proper sanitation in the highest degree, because the walls are vermin-proof.

"Fisklock" construction offers the lowest fire risk. There is nothing that can burn—no frame, boarding, furring or paper—not even lath, because the plaster is applied directly upon the inside wall. "Fisklock" is made of hard-burned clay, which in the brick kiln has already been subjected to a greater degree of heat than is possible in any ordinary conflagration. The insurance on a "Fisklock" house is but two-thirds that of a similar structure built of wood. Painting expense is permanently eliminated because the exterior walls require no attention either in this way or in other repairs, for the reason that they never are subjected to rot, disintegration, settling, or any of the ills constantly manifested in wood structures. Because of these facts, the cost of maintenance and depreciation is reduced to the veriest minimum. In beauty a "Fisklock" house possesses all the artistic characteristics of the highest grade of modern face brick—in shape, size, texture and color, and it employs the same interesting texture and color of mortar joints.

Details of Construction

The construction of a "Fisklock" house is a very simple matter. But three kinds of brick are required—"Fisklock," a few solid "Tapestry" brick to match, and some common brick for "backing up" the solid brick. With these three units the bricklayer can carry out all the details of ordinary brick construction, such, for instance, as corners, window openings, panels, soldier courses, rowlock courses, gable ends, flat and circular arches, and so on.

In bonding to secure the maximum advantages "Fisklock" should be laid in "running" bond. Other bonds, such as English, Flemish or Dutch, may be secured by using solid "Tapestry" brick headers, but this introduces considerable extra expense and the likelihood of "through" mortar joints.

Because of its freedom from "through" mortar joints—an absolutely novel and practical feature in brick construction—furring and lathing are unnecessary on the inside of the walls. The plastering may be applied directly on the brickwork, thereby eliminating fire risk and the chance for vermin.

"Fisklock" brick construction requires no waterproofing other than that which is applied on the back of the solid brickwork around window and door openings or wherever there are "through" mortar joints by reason of solid brick being used. As in the case of any good masonry house, careful caulking should be done around window and door openings in order to prevent transmission of water through the open crevices. This can easily be accomplished from the front and back of the walls before the staff beads and plastering are put in place.

It is preferable that second-story floor beams should be hung on iron hangers, as required for 8-inch walls by the building codes of many cities. The continuity of "Fisklock" construction should not be interrupted by cutting the beams into the walls. Where the latter is done it is necessary to cut the "Fisklock" and fill in between the beams with solid brick. This introduces the liability of "through" mortar joints and necessitates the use of waterproofing at such points.

Those wishing complete details of this new conception in brick will be interested in "Fisklock"-"Tapestry" brick, a descriptive booklet containing numerous detail drawings and other illustrations showing the adaptability of "Fisklock" brick to any of the situations ordinarily occupied by common brick. This booklet may be had from the Boston office of Fiske & Company, Inc., at 25 Arch Street, or the New York office, at 40 West 32d Street.

POMEROY HEAVY GAUGE HOLLOW METAL FIRE RETARDANT WINDOWS FOR STREET FRONTS

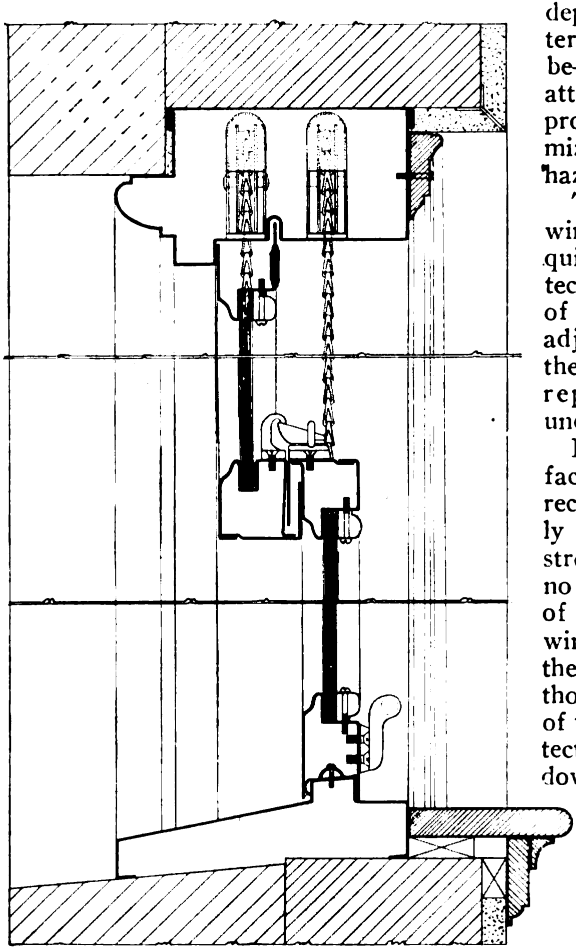
In spite of the millions spent yearly for fire-fighting and fire-prevention apparatus, systems and methods, the conflagration risk is an increasing hazard on property in all large cities. It has been demonstrated disastrously, time after time, that even a so-called "fireproof" building—or at least its contents—cannot resist the sweep of a conflagration.

Fire-extinguishing and fire-prevention apparatus within a building have been brought to such a high degree of refinement and dependability that the internal fire risk is—or can be—minimized. But less attention has been paid to protective means for minimizing the external fire hazard.

True, good fire-retardant windows have come into quite general use for protecting the sides and rear of buildings from fire in adjacent structures. And their effectiveness has been repeatedly demonstrated under the most severe tests.

In spite, however, of the fact that conflagrations of recent years have repeatedly proved that even a city street of ordinary width is no obstacle in the path of destruction, street-front windows are neglected in the protective measures, though the other exposures of the building may be protected by hollow metal windows and wire glass.

One reason for this neglect is found in the prejudice, on the part of owners and tenants, against polished wire glass in street front



THE STEADY SUBSCRIBER

How dear to our heart is the steady subscriber, who pays in advance without skipping a year;
Who takes out his money and offers it gladly, and casts round the office a halo of cheer,
Who never says, "Stop it, I cannot afford it," or "Getting more papers each week than I read,"
But always says, "Send it, the whole office likes it, in fact it is one indispensable need."
How welcome his check or his crisp U. S. dollars; how he makes our heart throb and our eyes fairly dance.
We outwardly thank him, we inwardly bless him—the steady subscriber who pays in advance.
—*Revised version of lines by F. N. in National Food Magazine.*

openings. Another reason lies in the difficulty of finding a fire-retardant window suitable for street fronts.

As to the first objection, this point has been vastly exaggerated. Certainly wire glass in street-front windows is no more objectionable to those within than wire glass in side or rear windows. No one but an expert can discover any difference in the light-giving capacity of polished wire glass and clear plate glass. And the wire itself in the glass soon ceases to be noticeable.

The second, and the only legitimate, objection to fire retardant windows for street exposures is now removed by the introduction of the Pomeroy Heavy Gauge Window, designed specifically to combine with maximum fire retardant qualities the rich and dignified appearance demanded in a street window.

In all essentials, this Heavy Gauge Double Hung Window follows the standard Pomeroy practice, which considers a window as a permanent feature of a building, properly to be expected to have a life equal to that of the building itself. In refinement of design and workmanship it represents the summation of almost twenty years devoted exclusively to fire window construction.

In its manufacture, costly special dies are used for all punching, assuring absolute uniformity. The bending and moulding of the metal are done on heavy special machines which give sharp clean-cut work without injury to the material. Where other manufacturers use rivets, Pomeroy Windows are electrically welded.

All parts are made in quantities, absolutely interchangeable. They are then assembled by expert window workers, properly squared and trued up, and finished as rugged, rigid units.

While the strength of this window is such that replacement of parts is not anticipated, yet all wearing parts have been made to be easily and quickly replaceable.

Ordinarily, the material used is heavily galvanized sheet steel about three times the weight of that used in the best regular Labeled Underwriters' Window. The added strength and rigidity thus assured must appeal to architects and owners.

On order, however, this window can be made in heavy gauge copper or bronze, thus furnishing all the embellishment needed for the most handsome building front.

The standard construction uses single-light sash. The style can be changed on order, however, to accommodate two or more lights per sash, by muntin bar construction. Either polished wire glass or clear plate glass can be used, though obviously wire glass is the only safe fire retardant to use. The window can be furnished glazed or unglazed, as desired.

Silent and easy operation is assured by making the sash run in smoothly finished zinc- or brass-lined grooves. The workmanship is such, both in machining and assembling, as to keep the channels straight and clear and uniform in cross-section. And the construction is so rigid that distortion and resultant binding are impossible.

As to weather qualities, the Pomeroy Heavy Gauge Window is beyond all criticism. The details presented here show clearly the precautions taken to assure sustained tightness without impairing the ease of operation. *Weather-stripping will never be needed where this window is installed. Its construction is a guarantee against drafts, waste of heat, and the sifting in of dust and dirt.*

One very attractive feature of the Pomeroy Heavy Gauge Window is that all surfaces, except the interior of the meeting rails, are open and accessible and easily painted. Each window is given a heavy coat of protective metal paint before shipment.

The Pomeroy Heavy Gauge Window is designed to take the place of the copper-kalameined construction so often used for street-front structures. As compared with the latter, this Pomeroy Window is lower in first cost and, because of its greater durability, it will also prove lower in last cost.

This window is equipped, on order, with the Stevens patent automatic closing device, for which this company is exclusive licensee. This type of device marks a distinct advance over all previous practice and is the one demanded by the New York State Labor Law requirements. The gold medal of the American Museum of Safety was awarded the company on one of its standard windows equipped with this device.

The field of application of the Pomeroy Heavy Gauge Window is wherever maximum fire protection is sought in connection with the best mechanical and architectural features. Properly coming within this field are high-class office, loft and store buildings, hotels and apartment houses.

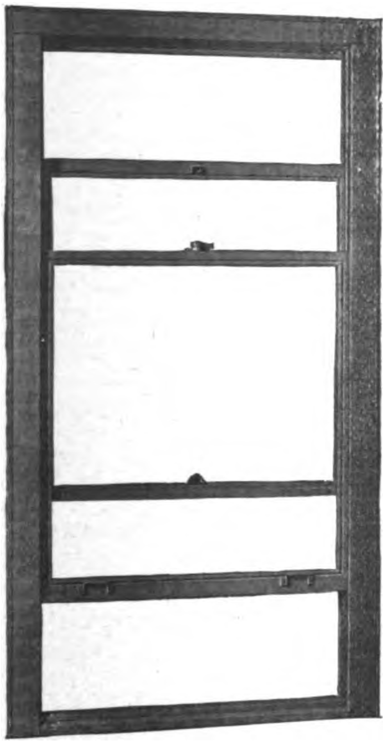
While designed particularly for street-front exposures where architectural embellishment is sought, yet the merits of this window recommend it for use even on side and rear exposures in a build-

HOW'S THIS FOR CO-OPERATION!!

At the thirteenth annual convention of the Association of American Portland Cement Manufacturers, held in New York city last December, a tax of three-quarters of a cent on every barrel of cement was levied. This will create a fund of $700,000, which it was voted to apply to national advertising of the advantages of concrete in all construction work. Have you noticed in reading your *Saturday Evening Post* some of the full-page displays with the slogan "Concrete for Permanence" at the bottom? You have, eh! Well, every single page of such advertising costs not one cent less than $5,000 for one issue! The concrete men know the worth of advertising. Instead of closing their ears and running away from advertising they reach out for it with warm, welcoming smiles and pleading, outstretched arms. Let some of their brothers who manufacture other firesafe materials and devices take serious notice. I have often thought that a majority of the prominent men in the cement business must be college fellows—for if there is one thing the college lad knows the value of, it is team work, the strength of associated effort, the idea of all for one and one for all, the putting of his body, mind and soul into a concerted effort with other men for the attainment of one end, one common purpose for the good of all. Nuf sed!

ing erected to conform with the highest standards. Its slightly higher first cost is but an insurance against window depreciation and an assurance that the windows will at least last as long as the building.

Descriptive matter on this new window, and full-sized details with specifications and prices will be furnished on application to the S. H. Pomeroy Co., Inc., 30 East Forty-second street, New York City.



The design and manufacture of fire-retardant windows is a specialty to which the company has given some twenty years of concentrated attention. The present Pomeroy line includes twenty-seven standard types of hollow metal fire-retardant windows, besides hollow metal sectional fire-retardant partitions.

The company invites an opportunity to work with architects, engineers and contractors in the solution of all window problems—placing its experience and facilities at their service in securing maximum fire-retardant efficiency.

The Third National Exposition of Safety and Sanitation will take place at the Grand Central Palace, New York City, during the week of April 17, 1916.

FIRESAFE ACTIVITIES

February 8-10, Illinois Clay Products Association at Hotel Jefferson, Peoria, Ill.

February 9-10, Oregon Clay Workers Association at Hotel Albany, Albany, Ore.

February 12-19, Ninth Chicago Cement Show at the Coliseum and Armory, Chicago, Ill.

February 14-17, Annual Convention of American Concrete Institute at the Auditorium Hotel, Chicago, Ill.

February 15-18, Second National Conference on Concrete Road Building, Auditorium Hotel, Chicago, Ill.

February 16-26, Complete Building Show at Coliseum, Cleveland, Ohio.

February 17-18, Annual Convention of American Concrete Pipe Association at Auditorium Hotel, Chicago, Ill.

February 17-19, National Builders' Supply Association, Hotel Statler, Cleveland, Ohio.

February 21-24, American Ceramic Society, Cleveland, Ohio.

February 21-26, National Brick Manufacturers' Association, Hotel Statler, Cleveland, Ohio.

February 22-25, American Road Builders' Association at Pittsburgh, Pa.

February 23-24, Western Ontario Clay Workers' Association at London, Ont.

February 29-March 4, Tenth Annual Mi-West Cement Show at Omaha, Neb.

CEMENT SHOW LIKELY TO BE A BIG SUCCESS

This year's mammoth Cement Show at Chicago on February 12 to 19 gives every indication of terminating a greater success than ever before achieved. The Cement Products Exhibition Company has in past years worked to gather together a display of materials which would reveal the widest possibilities of concrete. But this year's exhibition will be devoted entirely to ideas regarding the whole range of uses to which concrete is applicable, and the forces back of the exhibition will be constituted in an especially large number of co-operating cement companies.

The Cement Show will have five grand divisions: (1) roads, streets and alleys; (2) structural and decorative possibilities of concrete: (3) opportunities for the rural contractor; (4) the making of high-grade units with modern facings; (5) tests of full-size cylinders to prove the value of good as against poor concrete, and clean as against dirty material.

Each year shows greater demands upon cement for decorative designs; for which reason it is likely close interest will be manifested in the division devoted to structural and decorative work.

An interesting feature will be an exhibition of photographs and charts showing the reconstruction work upon the recently destroyed Edison plant, revealing much stronger construction at present than that which characterized the old structures.

There will also be numerous photographs of the Salem conflagration, and the mammoth building of the Naumkeag Steam Cotton Company, whose weave-shed is the largest in the world.

Twenty-six cement companies have co-operated to make this year's Cement Show "the biggest and best ever."

PROGRAM FOR AMERICAN CONCRETE INSTITUTE

The American Concrete Institute will hold its annual convention in Chicago on February 14, 15, 16 and 17. This will permit those members attending an opportunity to visit the Cement Show and some of the gatherings of other organizations convening in Chicago during the same period. Because of the desire of the directors of the American Concrete Institute to co-operate as much as possible with other bodies devoting their efforts to concrete work, the program has not as yet been completely decided upon.

The institute will hold its sessions mornings and evenings. It is probable that joint sessions with other organizations will take place during some of the afternoons. The evening of February 16 has been set for the annual banquet.

The following papers have been arranged, in addition to committee reports:

W. P. Anderson—The Design

of Reinforced Concrete Buildings.

Wm. M. Acheson—The Essential Features for the Construction of Concrete Highways.

D. A. Abrams—Tests of Sands for Concrete.

Wm. C. Archer—The Operation of the New York Workmen's Compensation Law to Date.

Burtis S. Brown—Recent Tests of Reinforced Concrete Columns.

J. M. Braune—Tests of Concrete Materials at Cincinnati.

Chas. C. Brown—How Shall a Rational Specification for Gravel Concrete be Developed?

Edward D. Boyer—Swimming Pools.

Frank H. Fay—Concrete Conduits for Fall River, Mass.

P. P. Furber—Requirements of Building Codes for Columns and the Design of Columns.

W. W. Horner—The Design of Plain and Reinforced Concrete Sewers.

W. K. Hatt—The Genesis of Reinforced Concrete Construction.

H. L. Lowman—An Interpretation of the New Standard Building Contract Documents.

Lamar Lyndon — The Design and Construction of the New Dam and Reservoir at Austin, Tex.

J. H. Libberton—The Durability of Concrete Pipe.

Maynard & Baker—Concrete on the Massachusetts State Farm.

Moore & Fuller—Tests Showing Continued Deformation under Constant Load.

Coleman Meriwether—The Manufacture and Use of Reinforced Concrete Pipe.

Ridgway & Goodwin — Novel Methods of Concrete Construction on the New Subways in New York.

George A. Rankin—The Nature of Portland Cement.

Clifford Richardson — Concrete Foundations for Heavy Traffic Street Pavements.

Frank Raschig—Concrete Viaducts.

C. W. Simpson—The Construction of the New Concrete Viaducts on the Lackawanna Railroad.

Earl B. Smith—Tests of Large Size Concrete Slabs.

Ralph A. Sherwin—Forms for Concrete.

R. D. Stubbs—Pavements.

George Sampson — The Reinforced Concrete Water Tower at Middleboro, Mass.

Wilson Fitch Smith—Methods of Construction at the Kensico Dam. Catskill Water Supply, New York city.

Charles Upham—The Construction of the DuPont Concrete Boulevard.

H. S. Van Acoyoc—The Construction of the Toronto-Hamilton Highway by Day Labor.

IOWA CLAY PRODUCTS MANUFACTURERS' ASSOCIATION

The program of the convention of the Iowa Clay Products Manufacturers' Association, to be held January 31 to February 5 at Iowa State College, Ames, Iowa, shows a most promising and instructive list of subjects. The following speakers have been arranged for, some of whom will present more than one paper:

A. V. Blenheimer, of the Bureau of Standards and director of the New York State School of Clayworking and Ceramics;

Dr. G. C. Mars, department of service of the Hydraulic-Press Brick Company;

H. W. Wagner, M. E., Iowa Engineering Experiment Station, Ames, Iowa;

M. P. Cleghorn, Department of Mechanical Engineering, Iowa State College;

Matt L. King, secretary of the Permanent Buildings Society of Iowa, Des Moines, Iowa;

D. T. Farnham, Homer F. Stanley and several others are to present papers.

An indication of the progressive spirit of Iowa is shown when it is mentioned that the legislature voted a special appropriation so that the college would have proper funds with which to attract to this convention speakers of prominence.

On February 2 the business sessions of the Permanent Buildings Society will take place. Mr. Matt L. King is the secretary of the society. In connection with this item a number of courses dealing with farm subjects have been planned for the week beginning January 31 at the Iowa State College. One course will deal with the proper construction of permanent farm buildings.

CEMENT MANUFACTURERS' ASSOCIATION REORGANIZES

At their annual meeting last December 13, the concerns back of the Association of American Portland Cement Manufacturers wrought a complete reorganization, determining upon a year of increased activities, part of which will be an aggressive campaign to increase the use of their product, to establish higher ethics in all branches of cement work, and to develop new uses for cement. In future, the principal office of the organization will be at Chicago instead of Philadelphia, a move which will be made very shortly. Besides the Chicago headquarters the association proposes to operate an important office in New York, and several other cities will also be used in the same way in order to adequately cover the country.

These increased activities have made necessary a new office—that of general manager—and Mr. J. P. Beck, publicity manager for the Universal Portland Cement Company, has been elected to the post. Mr. Beck has successfully managed several of the Chicago Cement Shows as well as exhibitions in New York, Pittsburgh and Kansas City. Mr. Beck was also secretary of the National Conferences on Concrete Road Building.

Many changes have been effected in the other offices. B. F. Affleck, president of the Universal Portland Cement Company, is president of the new organization. F. W. Kelley, president of the Helderberg Cement Company, is first vice-president. Richard Hardy, president of the Dixie Portland Cement Company, is second vice-president. G. S. Brown, president of the Alpha Portland Cement Company, is treasurer. J. J. Matthes, treasurer of the Alpha Portland Cement Company, is assistant treasurer of the association. Percy H. Wilson has resigned the secretaryship of the association. His post has not as yet been filled. L. R. Ferguson remains as assistant secretary.

An advisory committee has been formed consisting of J. R. Morron, G. S. Brown, E. M. Young, J. B. Lober and B. F. Affleck.

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Will Not Prevent Your Building
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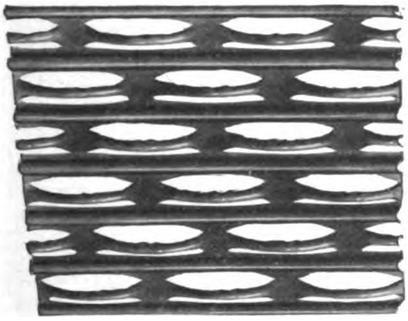

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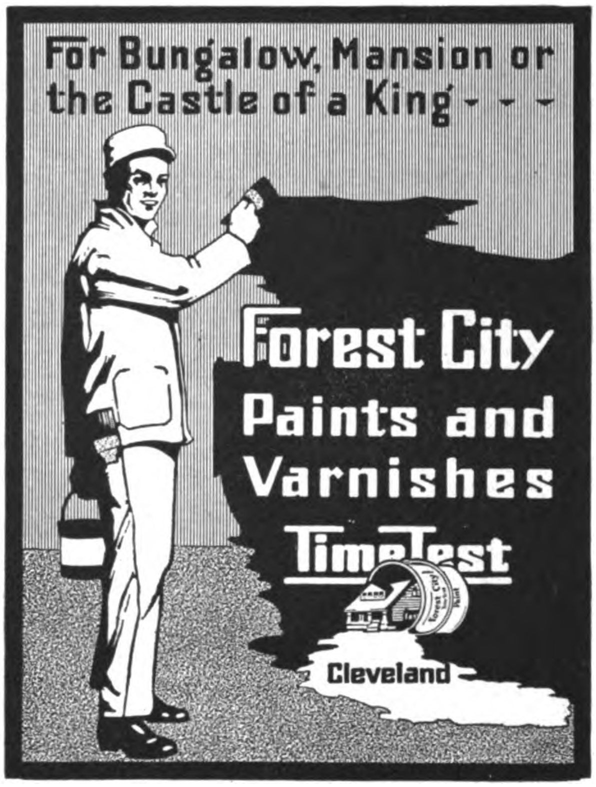

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HIRD AND NICKEL PLATE
LAKEWOOD, O.

SAFE HOMES EDITORIAL

(Continued from page 106)

educational influence, is rapidly changing from a city of frame houses to one of safe and sane buildings with fire resistent and fire-retarding materials.

Just as rapidly as the public comes to know that at practically the same cost as a burnable home one can build a house that will be effectively fire-resistent, the latter is certain to move into pronounced favor. This has been proved in Chicago. It will be repeated this year in Cleveland, for nowhere in the country is this educational campaign being pushed more effectively.

In the Safe Home department of later issues will be presented a number of the prize-winning house plans.

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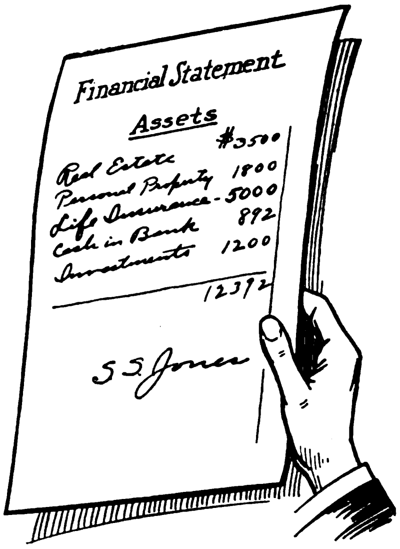
A MAGAZINE is measured by the value of its service. CONSTRVCTION represents thirteen months of constant investigation, research, tabulation of data, conferences and other work, part of which was an extended tour of the eastern and central western states to present the propaganda of the publication and learn what leading professional and business men related to fireproofing thought of the proposition. Prominent architects and engineers, large contractors, almost all the leading manufacturers, fire chiefs, association secretaries, municipal building officials and others were among those interviewed. The results of the trip are most encouraging, proving that the planning has been along proper lines and that men realize both the power and the need of intelligent national publicity to advance firesafe building.

You now have an opportunity of analyzing CONSTRVCTION—of passing upon the first results of all the past months' work. What do you think of it? Study it carefully—then give us the benefit of your candid thought, be it encouragement and appreciation or a kindly word of constructive criticism; one will be as sincerely welcomed as the other; all are guiding thoughts which point the way to greater SERVICE.

Boosts your credit when you call on the banker



When you seek a loan from a bank or from anyone else, you've got to show how you stand, and outside of actual real-estate or personal property, there's nothing that more surely stamps you as a citizen worthy of credit than the fact that you carry life insurance.

Policies of insurance mean that money is in the till if anything happens, that you are thoughtful and prudent, and that you practice self-denial in order to protect those depending on you, and those you may owe.

Carrying insurance means also that you are a good *moral* risk, the kind that even hard-headed bankers will take a long chance on.

The late J. P. MORGAN said:

> "*Commercial credits are based upon character before anything else.*"

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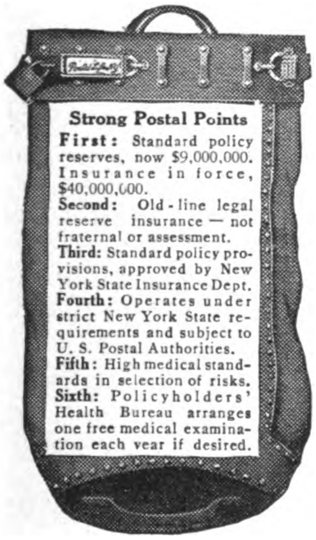
So carry all the insurance you prudently can, and when it comes to that, you want to get the most and best for your money. You want sound protection at low net cost and you should therefore turn to the institution that supplies it—



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Occupation....................

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Constrvtion for February.

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Not Made to Meet a Price, but to Set a Standard of Service

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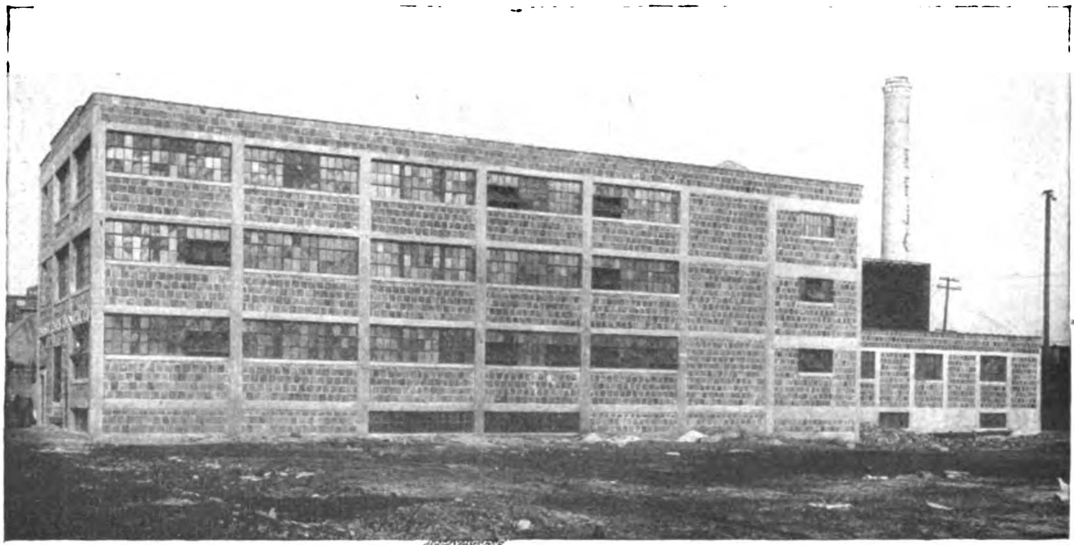

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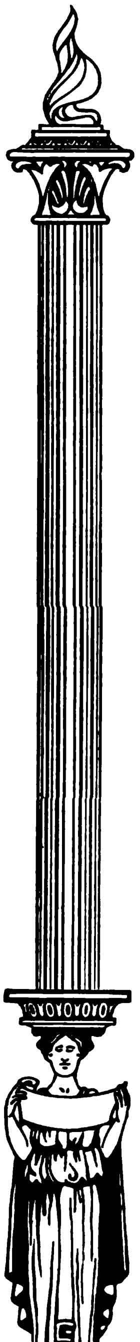

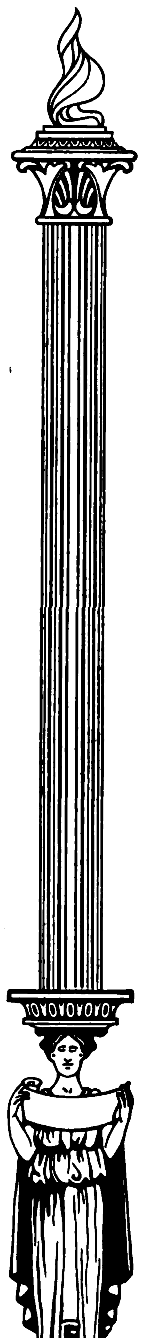

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IT PAYS TO "ZAHNERIZE"

Send a card for literature and samples.

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42d STREET BUILDING

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Fireproofing Information Bureau

¶In establishing this complete reference service, manufacturers and others producing catalogs, house organs, price lists, etc., are requested to forward their printed matter and samples and place CONSTRVCTION on their permanent mailing lists.

¶The FIREPROOFING INFORMATION BUREAU is intended for the use of resident and visiting architects, engineers, contractors and the general business and professional firesafe building fraternity, as well as prospective building owners, to whom its use will be extended gratuitously.

¶Every effort will be made to develop and maintain this Bureau to a high point of efficiency.

¶Prompt coöperation is solicited.

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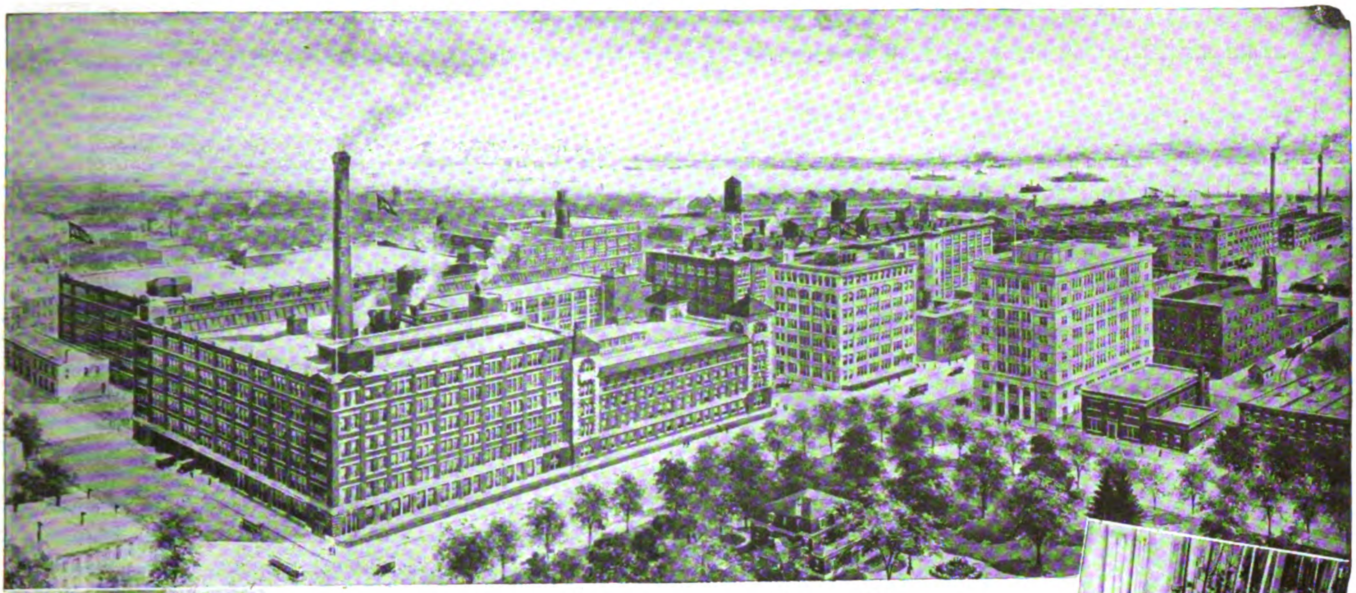

General view—assembling sound boxes, testing sound boxes and assembling governors and taper tubes

Assembling sound boxes

Assembling Victrola IX's

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The Victrola first
sees *Daylight* through

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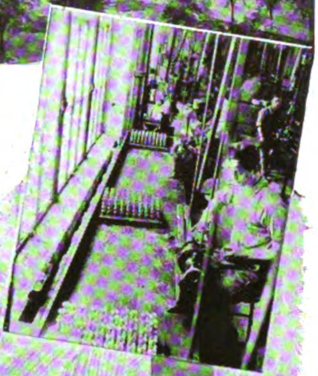
Lupton Service awaits your problems—they will be solved by experts without the slightest obligation.

The Lupton Catalogue No. 8, a veritable textbook on Daylighting and Natural Ventilation with interesting illustrations, mailed upon request.



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Bessemer High School
Bessemer, Mich.

Central School Building
Charleston, Ill.

The story is a familiar one. The youngsters are sent off to school in the morning, happy and smiling. At noon their little burned and withered bodies are carried home. Between life and death stood a matter of pennies or just thoughtlessness—pennies that would have bought building material that *could not burn.*

And that material, too, would have cost less than wood in the end—for it CANNOT warp or crack or chip—never requires paint—will stand up under any kind of weather—and retain its original beauty indefinitely. That material is—

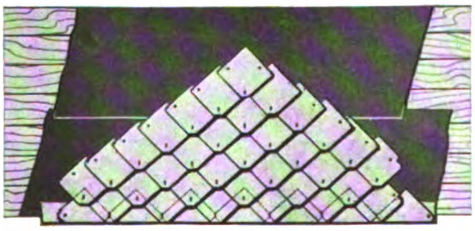
Ambler Asbestos
Building Lumber

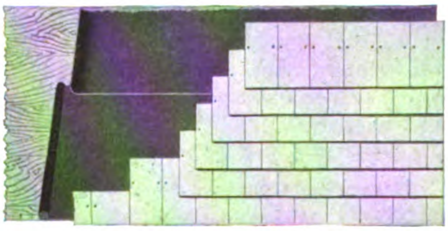
Ambler
Asbestos Shingles
Century Brand

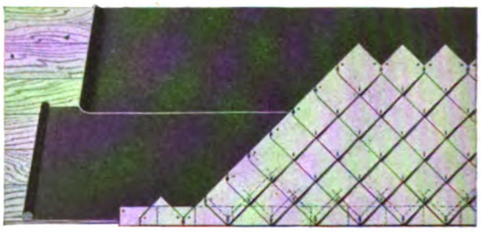
Both are made from the best obtainable Portland cement thoroughly mixed with pure asbestos fibre—neither of which are subject to heat or atmospheric activity and consequently will not burn or carry fire. The builder who specifies either is not experimenting, for Ambler Asbestos Shingles cover more than 100,000 buildings in every section of the United States—and Asbestos Building Lumber has made numberless stairways—elevator shafts—walls and partition walls FIRETIGHT.

There is no end to the uses to which Ambler Asbestos Building Lumber can be put. It fits in wherever a building material is required that WILL NOT BURN—and its other virtues recommend it for use in other fields where FIREPROOFNESS may not be the greatest consideration.

Shall we send you samples—and literature? Write today. The story is a compelling one—and worth knowing, and perhaps before long you will WANT to know it.







KEASBEY & MATTISON CO., Ambler, Pa.
Makers of FIREPROOF Building Products

CONSTRVCTION

WITH A DEPARTMENT DEVOTED TO

SAFE HOMES

VOL. II MARCH, 1916 No. 3

Firesafe Construction of School Buildings

By C. Stanley Taylor

[*The correction of hazards in existing school buildings was discussed in the Feburary issue of CONSTRVCTION*]

HAVING considered the question of the fire hazard in existing school buildings, it is plainly evident that new buildings to be used for educational purposes should be so constructed as to eliminate the conditions which allow the existence of such hazards.

The subject of firesafe school building is naturally divided into two sections—the construction of one-story buildings and that of buildings having two or more stories.

The Small Schoolhouse

As there is comparatively little danger of loss of life in fires which occur in the small one-story schoolhouse, popularly known as the country school, the question of fire prevention in this type of building resolves itself into a consideration of buildings which afford permanency, are conflagration-proof, and so constructed that the fire hazard does not seriously threaten interruption of educational work and a direct loss to the community.

The first and most important step in the construction of such buildings is to provide masonry walls and firesafe roofs. The burning of hundreds of frame school buildings annually is proof positive that this type of construction is a distinct menace to the community and invites loss by fire. The use of wood shingles on school buildings, in common with the use of such shingles on *any* building, shows either a deplorable lack of knowledge of modern building practice and existing fire hazards or a tendency to disregard en-

Typical School Building having exterior walls of stucco on hollow tile

MONOLITHIC CONCRETE SCHOOLHOUSE

Mineville, N. Y.

tirely the fire danger of the wood shingle. Two exits, as remote one from the other as possible, should be provided.

By the use of masonry walls and fire-retardent roofings exceptionally attractive results may be obtained—small school buildings pleasing to the æsthetic sense, permanent and affording low maintenance cost, and safe against the danger of flying brands from chimneys or nearby fires. It is interesting to remember in this connection that a large part of the great loss in the Salem Fire resulted from burning embers flying nearly one-quarter of a mile across a valley and lodging on the *shingle roof of a small school building.* This building, of frame construction, proved the nucleus of what is known as the second conflagration.

Types of Construction

There are several types of construction which may well be used in the building of small schoolhouses. Hollow building tile (terra cotta) faced with stucco or face brick; concrete monolithic construction; and brick-wall construction are the more important and commonly used types.

Various illustrations herewith show small school buildings of the monolithic concrete type. There is no necessity for the use of wood in the construction of such buildings—walls, floors, beams and columns are all of concrete reinforced with steel rods, wire mesh or expanded metal. Partitions are of concrete, metal lath and cement plaster or of hollow tile. Stairways are also of reinforced concrete, enclosed with walls of concrete, terra cotta, metal lath and plaster, gypsum or wire glass to form means of escape in case of fire.

Concrete block construction is especially fitted for building of small schoolhouses. Blocks with air spaces are utilized, providing a wall that has excellent insulating properties against heat and cold. Such walls should also be furred, lathed and plastered on the inside to prevent condensation.

Hollow tile building blocks, faced with Portland cement stucco, may be used with economy and safety in the construction of the small schoolhouse. Here the dead air-spaces insulate against heat and cold.

Brick-wall construction, with face-brick exterior, offers an attractive finished appearance and has a high degree of fire-resistiveness and permanency.

It must be realized that if the interior construction of masonry schoolhouses of medium size is faulty, fire will spread as fast, and in some cases faster, than in such buildings of frame construction.

There are certain fundamental precautions in the construction of the medium-sized schoolhouse which will retard the progress of flames to such an extent that the danger of loss of life is removed. It is no longer necessary to use any but fire-resistive floors, the construction of which will be taken up later in this article.

The stairway exits in the school building of two or three stories should be placed in enclosed and stopped-off shafts of brick, tile, concrete, metal lath and plaster, gypsum, or wire glass and metal.

All chimneys should be built of brick, stone or concrete, should have walls at least 4 inches thick and should be lined on the inside with well-burnt terra cotta chimney tile set in Portland cement mortar. This lining should be continuous from the bottom of the flue to its extreme height. Chimneys should project at least 2 feet above the pitched roof, or 3 feet above the point of contact with the flat roof, and should rest on the foundation of the building.

No wooden supports of any kind should be used for chimneys. The supports must be of masonry or iron, starting from the foundation. Wooden beams or structural members should be kept at least 2 and, preferably, 3 inches from the chimney—plastering should be directly on the masonry or on metal lathing —no wooden furring.

No smoke pipe should be placed nearer than 1 foot from wooden members of any kind.

All heater pipes from hot-air furnaces, where passing through partition or floors, must be double tin pipes with at least ½-inch air space between them. No steam or hot-water pipes shall be nearer than 1 inch to any woodwork. Every steam or hot-water pipe passing through combustible floors or ceilings or wooden lath and plaster partitions should be protected by a metal tube 1 inch larger in diameter than the pipe. All wooden boxes or casings enclosing steam or hot-water heating pipes or wood covers to recesses in walls in which steam or hot-water heating pipes are placed, should be lined with metal.

The Large School Building

In considering the subject of the proper construction of large school buildings—and by large school buildings are meant buildings of two stories or more in height and having a floor area of 5,000 square feet or over—it must be borne in mind that no building in only the walls, floors and partitions are of fire-resistive construction can be called firesafe in any sense of the word. Such buildings, and fully 70 per cent of existing school buildings are so constructed, constitute the most dangerous type of firetraps.

The ideal firesafe school building has walls, floors and partitions of properly-constructed masonry, interior fire escapes located in smoke-proof and fire-resistive shafts and set well apart one from the other in order to afford proper means of rapid egress and to avoid dangerous congestion. All vertical openings in such a buildings are so built as to guard against the communication of fire from one floor to another, areas of over 5,000 square feet are divided by fire walls which are actually fire-resistive and will serve to confine fire and prevent its rapid spread. All interior trim must be incombustible, and window frames and sash of metal. Elevator shafts must be particularly well constructed from the standpoint of fire resistance, as, unprotected, they would have an enormous chimney effect, creating a draft which would carry fire from floor to floor.. Unprotected elevator shafts have been the most ordinary means of spreading of fire in the so-called "fireproof" building.

Build in a manner which will provide as little fuel as possible; safeguard basements, storage rooms, laboratories, workshops, kitchens and other special hazards with automatic sprinklers, and provide safe means of escape and proper barriers to check the spread of flames.

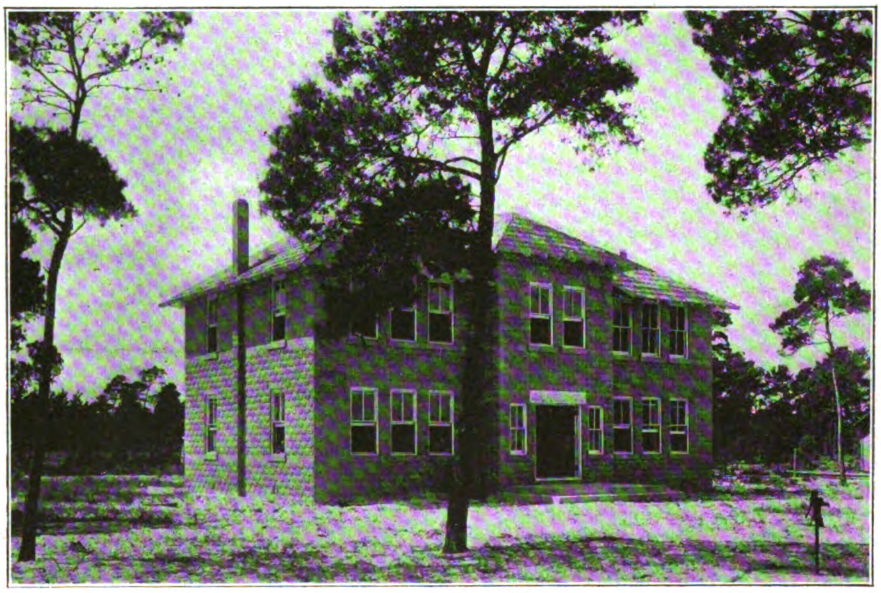
Exterior Wall Construction

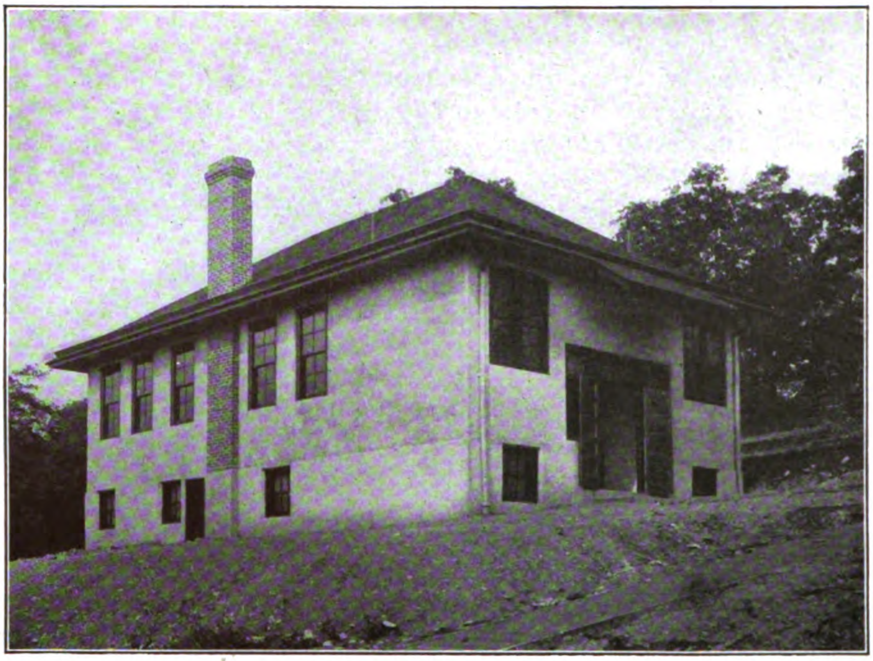
It is not the purpose of this article to discuss in detail the engineering requirements for the construction of the various units which comprise a consistently-built school building, but to call attention to the materials which have value from the standpoint of fire resistance.

In general, the thickness of exterior walls should not be less than 12 inches, allowable openings should

CONCRETE
BLOCK
SCHOOLHOUSE

Stuart, Fla.





ROSLYN FARMS SCHOOL

Splendid example of small concrete schoolhouse

Cost, $3,000 complete

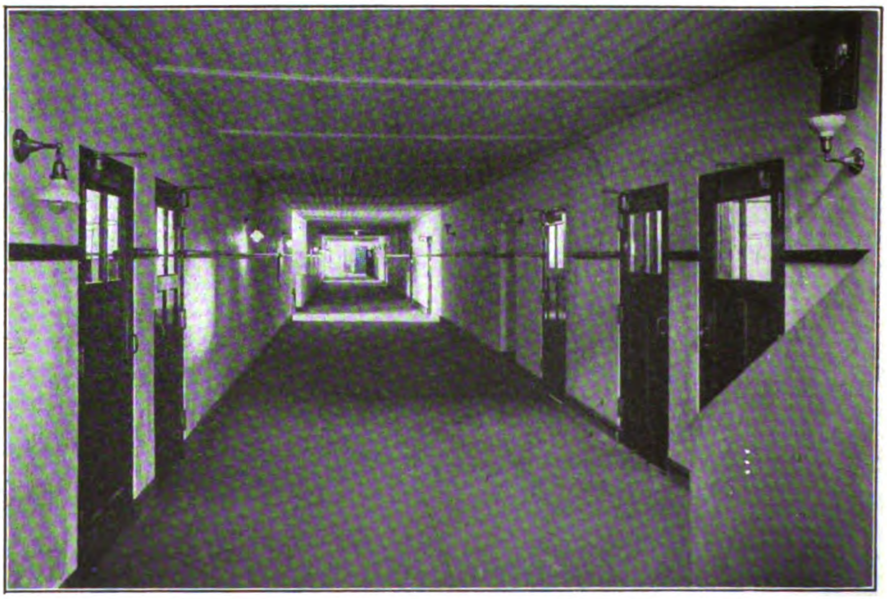
not exceed 40 per cent of the superficial area per story, and no ducts, chases or flues should be permitted within the limited thickness of the wall. All walls should be properly bonded and anchored at points where they meet and, when supported by structural steel framework, should be properly bonded and anchored thereto.

The materials of which fire-resistive walls may be constructed, as well as building requirements, are regplated usually by a State Code. Such a code is now maintained by many States and those which have no code are realizing its need and studying for its preparation.

The materials which may be safely used for exterior wall construction are concrete, hollow tile faced, with stucco or brick, and hard-burned brick.

Monolithic concrete construction for large school buildings has great value from the standpoint of fire safety, provided of course that the interior construction is consistent.

Such schools as those illustrated offer safety from fire, permanency, large window areas and, by the use



CORRIDOR IN NORFOLK, VA., HIGH SCHOOL

No opportunity for spread of flames

NORFOLK HIGH SCHOOL

Reinforced Concrete,
Skeleton and Floors
with
Brick Veneer

of architectural terra cotta or face brick for ornamentation, may be classed with any type of construction from the aesthetic standpoint.

Hollow building tile, faced with Portland cement stucco, is looked on with great favor in the State of New Jersey. The photograph on Page 139 of this issue shows an attractive building of this type. In this State load-bearing walls and partitions of hollow tile are allowed and have proven economical and satisfactory.

Schools of brick construction and face-brick exteriors offer attractiveness combined with safety. Face brick and architectural terra cotta, with the soft harmonious colors and designs obtainable by the use of these materials, undoubtedly offer a most attractive combination of building materials for school exteriors.

Exterior Wall Openings

All windows in exterior walls should be equipped with metal sash and frames. No wood should be used in this connection. Where conflagration hazards exist, and in all shafts having exterior windows, the windows should be glazed with wire glass and should be of the automatic closing type equipped with fusible links. All window openings exposed to buildings within 25 feet should be protected by the Underwriters' type of automatic rolling steel shutters or outside open sprinklers in addition to the fire windows. Where exterior fire escapes and balconies exist, windows should be glazed with wire glass and equipped with fusible links.

All doors in exterior walls of school buildings should be hollow steel or copper-covered wood or other

REINFORCED
CONCRETE

Central Avenue
Public School

Madison, N. J.

types approved by the National Board of Fire Underwriters wherever exposure hazard exists.

To replace the old style locks and keys, which add to the possibility of panic hazard in school buildings, panic bolts are obtainable. This locking equipment is arranged in such a manner that in case of crowding against a door from the inside the lock is released and the way of escape is opened. This constitutes an invaluable feature of proper school construction and has found much favor with school architects and school boards, many such bolts being already installed throughout the country.

Floors

All material entering into the construction of floors should be incombustible and able to withstand high temperatures for long periods of time.

Steel or reinforced concrete beams with interposed arches or slabs of proper materials and construction should be used for floors. All metal structural members must be protected by at least 2 inches of fireproofing for girders and 1½ inches for beams, such fireproofing to be properly attached to the members by steel reinforcement or other suitable means of anchorage.

Concrete T beam construction with light steel forms has the distinction of being extremely light and economical and simple in erection. The permanent steel forms can be very readily transported to the job and set up on narrow shoring instead of using solid form work. This shoring need be only six inches wide, for the average width of the beam is from four to five inches, and the flange on the steel tile is easily and quickly nailed to the shoring, making the whole form tight without the necessity of running a solid form beneath the floors.

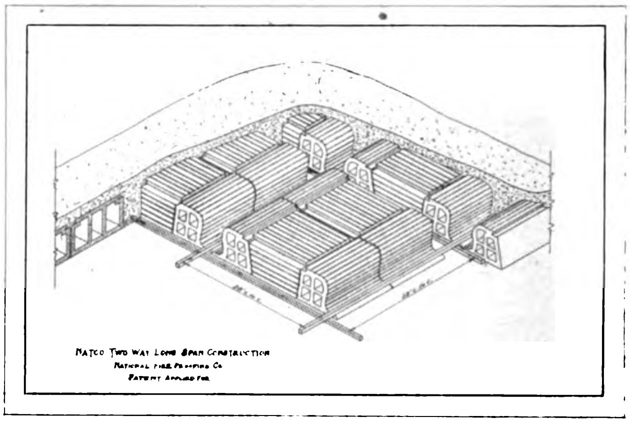
By using various depths of steel tile and various amounts of reinforcing steel in the bars, any ordinary load can be carried up to as high as thirty-foot spans. This is a particularly good advantage in the case of school rooms where wide unobstructed floors are necessary.

These same advantages of wide, clear spans apply to the ceilings, which can be built smooth and unobstructed over the full width of the span. There are two general methods of erecting the metal lath for fireproof ceilings under steel tile floors. The first is to lay the metal lath directly on the form work or shoring, set the tile on top and pour the floor in the usual way. Enough of the concrete and cement fills in around the lath as it passes the bare joist to hold it in place, or, if necessary, it can be wired through conveniently placed holes in the steel tile themselves. This proves an economical floor from a labor standpoint, and one which is to all purposes reliable.

The second method of erecting metal lath ceilings under steel tile floors is to extend tie wires through holes in the tile or over the reinforcing bars, and after the form work has been removed, erect the metal lath ceiling by fastening with these wires. Where it is desirable to erect a suspended ceiling, suspension rods are put into the joists and fastened around the reinforcing steel before the concrete is poured. These are afterward cut to the right length and the channels and lath fastened on in the regular manner.

The ends of the beams lend themselves readily to reinforced concrete, structural steel or brick walls, and in each case makes the necessity for heavy walls less because of the extreme weight saving in the floor itself.

An interesting and economical type of floor construction has recently been perfected by the National Fireproofing Company. This is a combination of hollow tile and concrete known as the "two-way, long-span system" and is illustrated herewith. The two-way system has been developed because it enables the architect to carry his floor loads in two directions in place of one and thus cut down the depth of the slab.


NATCO TWO WAY LONG SPAN CONSTRUCTION
NATIONAL FIRE PROOFING CO
PATENT APPLIED FOR

This new combination floor is designed on the same basis of T-beam action, as in the designing of roof slabs for concrete buildings of the beam and girder type, with a snow load approximating the live load for schools and in the construction of which the general practice is to use a 4-inch slab with the beams about 6 feet. In place of using wood to form the beam the contractor uses tile, which also furnishes a plastering surface. With combination floors it is customary to use beams about 3 inches wide, spaced about 15 inches on centers, but with the new type of combination flooring shown herewith the spacing of beams can be very much increased to the advantage of the design.

Columns

Columns should be constructed of steel or reinforced concrete, and steel columns properly protected by concrete, terra cotta or other fireproofing material.

Concrete columns should be properly reinforced and reinforcing bars hooped or bound to prevent disintegration by expansion. The corners of these columns should be beveled or rounded.

Vertical Openings

All vertical openings should be constructed and equipped to resist flame. Interior openings to ventilating shafts should be protected by automatic trap doors or shutters.

The walls of all shafts should be constructed of 8-inch, 2-cell tile, 6-inch reinforced concrete or 8-inch brick. Openings in stair, elevator and other shaft enclosures should be protected by approved self-closing fire doors. All fire doors should be mounted with approved wrought iron or steel hardware approved for this use by the Underwriters, and should be securely attached to the wall or partition, or to frames anchored thereto. Interior windows in stair or elevator shafts should be prohibited. Where glass is used in any part of shaft construction it should be wire glass. No open grille or openings of any kind should be permitted in any shaft.

Roof Construction

Roofs should be of fire-resistive construction, such as hollow tile or concrete, in a manner similar to that of floor construction; and various patented systems of construction and reinforcing now on the market are worthy of investigation and use.

Composition roofs of alternate layers of tar or asphalt and felt have distinct value for fireproofing and waterproofing purposes. Where shingle roofs are used wood shingles should be avoided and metal, asbestos, clay tile, slate or other types of approved fire-resistive or fire-retardent shingles used.

Stairways

All stairways should be constructed with the thought continually in mind of their use in case of fire. For this purpose all stairways should be enclosed in shafts of concrete, terra cotta, gypsum, wire glass and metal, or metal lath and cement plaster.

Stairways should never be constructed less than 42 inches in width, and should be equipped with hand-rails on both sides. It is estimated that 14 persons in single file descending pass a given point in one minute. The mistake is often made in schools of constructing stairs of a width greater than is proper for safety. Wide stairs are conducive to falling, which is fatal in time of panic, unless a center hand-rail is provided.

Corridors should be constructed of sufficient width to allow of the opening of doors without obstructing the passageway. Stairs should be continous to the street level, or to an unobstructed passageway offering safe egress to the street. No winders shall be allowed, and all treads and risers shall be uniform throughout. Stairways in schools should always consist of broken flights, as a straight descent tends to induce dizziness.

Stairs on which there exists a possibility of slipping are at all times exceedingly dangerous, but particularly so at the time of rapid dismissal in case of a fire alarm. At this time the descent is rapid and a fall would invariably mean a choking up of the means of exit by panic-stricken children. A little study of this subject will show that there are on the market several forms of non-slip stair treads, and it is strongly advised that this fact be taken advantage of in the construction of new school buildings. To make the stairs safe for rapid descent in case of fire must mean a saving of lives. Many committees, appreciating the need for such safeguards, have adopted safety stair treads, and others may be expected to follow suit as the merit of this protection becomes better known.

Partitions

All solid partitions should be of terra cotta, reinforced concrete, brick, gypsum or of metal lath and cement plaster. All doors should be of metal. Glazing of sash partitions, including doors, should be of wire glass in metal frames, and the balance of the construction of metal or insombustible material. No wood should be used in partitions.

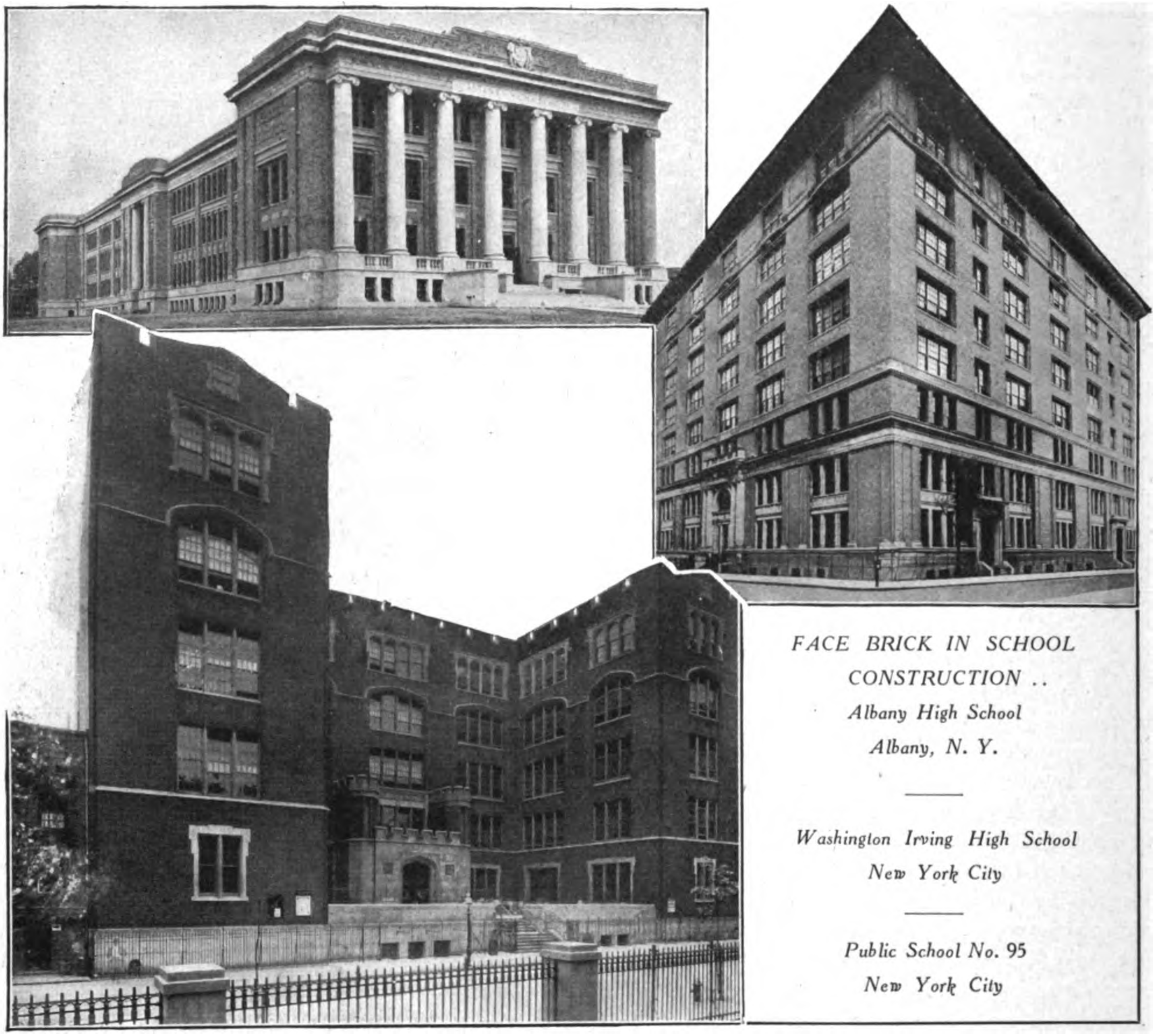
The danger of fire spreading from the basement is severe, and every possible precaution should be taken to isolate and extinguish basement fires. Basements containing only heating apparatus, storage rooms, etc., should be entirely cut off from other floors by proper fire stops and equipped with automatic sprinklers. Door openings from the basement to the floor above should be equipped with standard automatic fire doors.

Trim

The trim and doors used throughout a properly constructed school building should be of hollow metal, which has the distinct value of incombustibility, does not depreciate, and can be finished in a manner most pleasing to the aesthetic sense.

Fire Walls

Wherever there exists an area exceeding 5,000 square feet, a subdivision should be made by the use of a fire wall. Such a wall should be of approved masonry construction, not less than 12 inches in thickness and having all openings protected by standard automatic closing devices. Door openings should never exceed 80 square feet and should be protected by standard automatic fire doors or rolling steel doors on both sides. The standard automatic rolling steel door has particular value, offering a high degree of fire-resistiveness and taking up little space. This type of door is constructed to roll up and down, and is located above the door opening. It is operated by



FACE BRICK IN SCHOOL CONSTRUCTION ..

Albany High School
Albany, N. Y.

Washington Irving High School
New York City

Public School No. 95
New York City

fusible links and equipped with baffle-plates, which make the passage of smoke and flame around the door practically impossible.

Fire doors may be made continuous across corridors by the use of an automatic sliding fire door equipped with fusible link and located in a concealed pocket. In case of fire this door will be released and will cut off the corridor, stopping the spread of flames.

Sprinkler Protection

There are many places in school buildings where particular fire hazards exist. For example, in basement storage and boiler rooms, laboratories, cooking rooms, workshops, etc. Here automatic sprinkler systems should be installed to safeguard against fires which are at all times likely to start in these places. Sprinkler systems are invaluable for the purpose of reducing special fire hazards in school buildings, and many progressive communities are insisting on such installations.

Equipment

In the equipment of the school the use of wooden furniture, shelving, etc., should be avoided. Metal shelving should be used. All clothes lockers and closets should be of incombustible material and, if possible, should be confined to a single room on each floor, such room to be fitted with fire-resistive partitions and doors. Wherever possible, furniture should be of metal. The great advance in the art of constructing interior furnishings and fittings of metal has made it possible to obtain desks, chairs, benches, tables, waste baskets of metal, and for the storage of documents, card systems, etc., safe metal cabinets may be obtained. Such equipment does away with much of the contents hazard.

Chemical extinguishers offer a distinct and valuable service in connection with the safeguarding of school buildings against fire. Such apparatus offers a quick and easy means of extinguishing incipient blazes and should be installed throughout the basement, in all storage and supply rooms, and convenient to clothes lockers.

Dependable alarm systems should be installed and properly maintained. In a properly constructed school building the mooted subject of fire drills would no longer need argument, for the simple reason that fire drills would be no longer necessary. There is no doubting the need for fire drills in the average existing school building; but the doing away with this necessary evil will prove one of the rewards for consistent planning and construction of the building.

Comparative and Ultimate Costs

The first question which will arise in the minds of those who have read the foregoing article will be that of its practicability.

Many educational bodies have been confronted with the problem of safe school buildings, and in far too many instances have failed to put to themselves the question "Dollars or lives?"

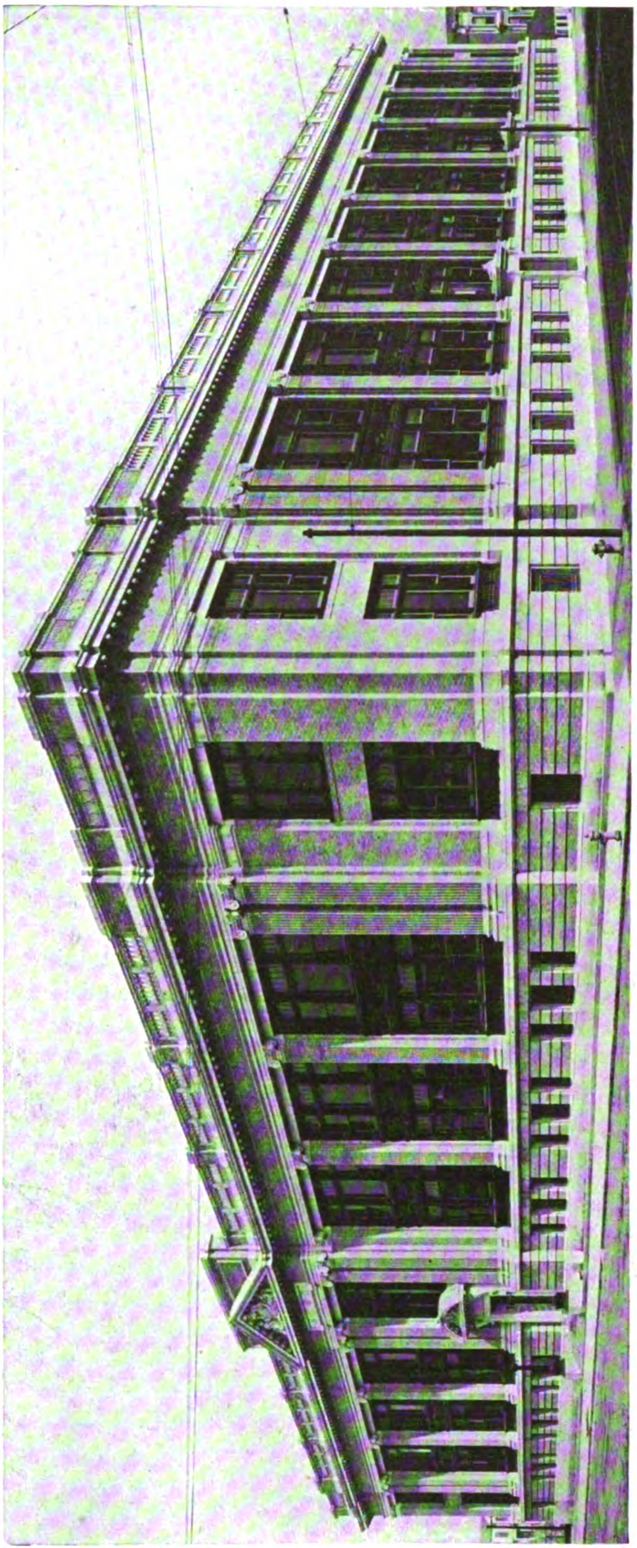
It seems at first glance that the many requirements for a consistently constructed school building render it impossible from the financial standpoint. This, however, is not the case.

At the present time all the materials and devices mentioned in this article are obtainable at a reasonable cost. The fundamental principle in the matter of safe school buildings is consistent planning, and in this connection money spent for the services of an architect who knows how to plan safely and wisely will mean a considerable saving.

The ultimate cost must not be forgotten! Recently, in Chicopee, Mass., a new school, costing over $200,000, was completely destroyed by fire. Fortunately no lives were lost, but the fact remains that if this money had been wisely spent for the proper materials and devices which are used in consistent fire-safe construction, a large sum of money and a serious interruption of educational propaganda would have been saved for that community.

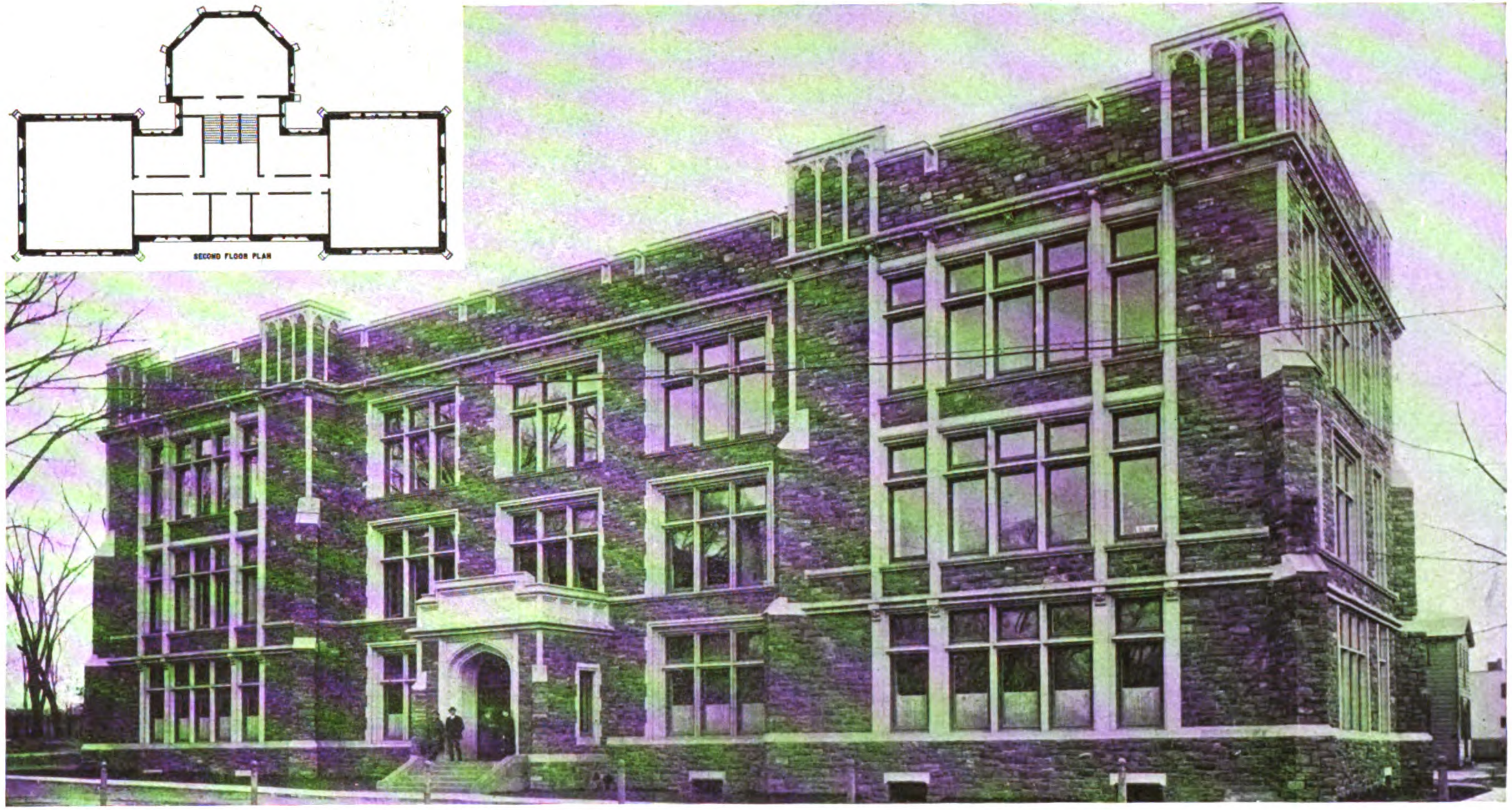
At the present time there exists among that portion of the public directly interested in educational undertakings far too little knowledge of the many existing uses of materials and devices for the purpose of fire-safe construction. New devices and materials are continually being brought forward in this field, each lessening the cost of construction and increasing the safety factor.

At the most, the cost of constructing school buildings along safe lines is certainly not more than 10 per cent above that of the construction of fire traps—the matter of such construction resolving itself into a careful study of the field and a selection of a proper and sen-



THE GIRLS' HIGH SCHOOL
San Francisco, Cal.

COLUMBIA UNIVERSITY AVERY LIBRARY



FORDHAM UNIVERSITY SCHOOL OF MEDICINE

NEW YORK CITY REILEY & STEINBACK, ARCHITECTS

A PLEASING COMBINATION OF STONE AND ARCHITECTURAL TERRA COTTA

Located as this building is, in an open park, there is no exposure hazard except in the rear of building. From an æsthetic standpoint the fenestration is skilfully disposed, but there is danger of flames passing through the windows from floor to floor.

COLUMBIA UNIVERSITY AVERY LIBRARY

sible combinations of materials and devices.

For instance, for large school buildings:

Monolithic concrete construction—floors, walls, roof, partitions.

Solid steel sash equipped where necessary with wire glass.

Metal lath and cement plaster partitions.

Metal doors and trim.

Walls of vertical openings, concrete.

Sprinkler system for special hazards.

Or

Hollow tile and structural steel construction, floors, walls, roof, partitions, and walls of vertical openings.

Exterior walls, Portland cement stucco on tile.

Metal doors and trim.

Hollow metal window frames and sash, wire glass where advisable.

Sprinkler system for special hazards.

Or

Brick construction for walls and partitions.

Floors of steel tile with ceilings, plaster on metal lath.

Metal window frames and sash.

Metal doors and trim.

Walls of vertical openings brick.

Sprinkler system for special hazards.

The above series of combinations of materials and devices merely illustrates the many possible combinations which may be obtained at reasonable cost. It is significant, however, to note that in all of the combinations there appear metal window frames and sash, doors and trim; wire glass and sprinkler systems for special hazards. This, then, is the important step (after selecting the material for the general construction of floors, walls, roof and partitions), *to be certain that the building is consistently planned—to do away with wood in the construction and to so construct the building that incipient fires will be isolated and extinguished!* Fire cannot travel unless paths are provided and proper drafts supplied. It has often and truly been said that the average so-called "fireproof" building—the building with the wooden doors and trim and inconsistent planning—forms a perfect furnace for the destruction of the contents.

This being the case, it is clearly the duty of officials of Boards of Education, and various bodies which have under their supervision the construction and equipment of school buildings, to avoid the building of fire-trap schools. It is not so much a question of the added expense, but rather one of proper investigation. When a new school is planned study conditions in the building field, inquire widely among the many manufacturers who are putting materials and devices on the market.

To obtain the factor of safety in the construction of new school buildings there are three steps: first, a *realization* of the fallacy of so-called fireproof construction; second, a *study of conditions* in the building field and the requirements which must be met to create a consistently firesafe school; and, lastly, a *sensible selection* of a proper combination of materials and devices after thorough investigation of the offerings of various manufacturers.

* * *

Profit by Experience

Architects working under direction of the Canadian Government made a complete survey of the Parliament buildings at Ottawa, which were fire swept in February last, and have filed their report.

They hold that, "with the exception of the central interior and the rear walls, the building itself can be repaired without entirely rebuilding." Most of the walls are still intact, and what is left of the building represents a value in labor and material of approximately $2,000,000, or considerably over half the original cost.

Of especial interest to readers of CONSTRVCTION is the declaration of the investigators that, "the new northwest wing, built six years ago at a cost of over half a million dollars, and made fireproof at the time, is practically intact, and the only damage has been from smoke and water."

So marked has been the contrast between the manner in which the fireproof and the non-fireproof sections of the famous structure underwent the fiery ordeal, that we are not surprised to learn that, "when reconstruction takes place, it is practically certain the whole building will be as near fireproof as it is possible to make it."

To house the priceless records of the Government in other than a structure as immune from fire as modern skill can make it, would be nothing short of criminality, and it is to be hoped that public authorities everywhere will take note of the experience at Ottawa and profit thereby.

In rebuilding that portion of the Linscott Block of Holton, Kans., burned some weeks ago, "the inside walls will be of brick or hollow tile, instead of combustible material, so that each room will be a distinct buiding in itself, so far as fire is concerned." The property is owned by George S. Linscott, president of the Linscott State Bank.

The Installation of Vaults

Regulations of the National Board of Fire Underwriters for the Installation of Vaults, recommended by the National Fire Protection Association

SPECIFICATIONS FOR VAULTS

Class A Vaults

Vaults designed to afford the maximum degree of protection and intended for the use of Banks, Trust Companies, and others having large values to protect. This type of vault involves massive construction, designed to resist long-continued fire, impact of falling objects, and attack by burglars (in so far as this feature can properly be incorporated in these specifications).

1. *Material*

a. Reinforced concrete. Walls, roofs and floors shall be of reinforced concrete and shall comply with the recommendations of the joint Committee on Concrete and Reinforced Concrete. (The following associations comprise the joint committee: American Society of Civil Engineers, American Society for Testing Materials, and American Railway Engineering Association.) The aggregate used for the concrete shall be composed of materials which do not readily calcine or spall.

Note.—The advantages for vault construction of reinforced concrete over other building materials are believed to be:

1. Monolithic construction.
2. Least likelihood of rupturing under high temperature expansion stresses.
3. Least likelihood of breaking under impact of falling bodies.
4. Most difficult to pierce.

While not recommended, it is possible that under certain conditions the use of a first class quality of hard-burned brick laid in cement mortar may be advisable for walls, or a combination of an exterior brick shell and an exterior concrete wall may be used.

b. Reinforcing Material. Rolled beams or rails are frequently used for roof and floor reinforcement and are occasionally used in walls as well, both to secure fire and burglar-resisting powers. They are advised in the case of roofs, because of their impact-resisting powers.

c. Continuous Construction. For vaults, it is essential that the concrete work should be carried on continuously as nearly as practicable and be thoroughly tamped and spaded. Walls should be carried up uniformly.

2. *Walls*

a. Support. Shall be built on ground (on rock if possible) in buildings which are not of fire-resistive construction and preferably also in those of fire-resistive construction. Class A vaults should not be located above the first floor.

Where supported on steel framework of a building, supporting steel should have especially large factor of safety, shall be protected with at least 6 inches of reinforced concrete, and reinforcing material around columns and beams shall be securely anchored.

Note.—Concrete is specified for protection to steel, because both materials have approximately the same coefficient of expansion.

b. Independence. Walls of vaults shall be entirely independent of those of building, and at a sufficient distance to permit of inspection.

c. Carrying Floors. Floors of building shall preferably be independent of vault walls, but, if connected, shall be so arranged that in event of building collapsing they will pull away without reducing the strength of fire-resisting qualities of the vaults.

d. Thickness. Reinforced concrete wall shall be at least 16 inches thick. Brick walls shall be at least 20 inches thick. If concrete wall is protected with a brick shell, concrete shall be at least 12 inches, and brick at least 8 inches thick.

3. *Roof*

a. Thickness. Shall be at least 4 inches greater than for walls, and, in buildings where great impact possibilities exist, frequently much thicker.

b. Strength. Shall have strength of spans consistent with surrounding conditions, especially possible impact of falling bodies, such as walls, safes, and machinery.

c. Interior Columns. Where span is sufficiently large, the introduction of interior columns or girders or division walls may be necessary. Steel columns or girders shall be protected with at least 2 inches of reinforced concrete.

4. *Floors*

a. Thickness. Shall be at least 12 inches thick where laid upon ground or on beams to permit inspection, and thicker if deemed necessary.

Note.—To permit of inspection to protect against tunneling into vaults, floors are sometimes placed on parallel beams.

Where vault is over one story high, and where each story is entered separately, the floors between stories shall be at least 6 inches thick and not pierced.

b. Flooring. No combustible surface flooring shall be used.

5. *Entrance Enclosures*

Entrance enclosures of fireproof construction are recommended to protect doors of very important vaults against fire.

6. *Doors*

a. Single doors (without inner doors, creating dead air spaces) shall be at least 16 inches thick, and shall contain at least 6 inches of concrete filling of as large an area as the design will permit.

b. When double doors are used, outer doors shall be at least 8 inches thick, and shall contain at least 3 inches of concrete filling of as large an area as the design will permit.

NOTE.—In either case it is believed safe to rely upon the features of design which provide for protection against burglars, to insure a proper container for the concrete filling and ample locking facilities.

c. Emergency doors, if provided, shall be equal in strength and thickness to main door, and an interference device shall be provided to prevent the main door being closed until the emergency one is closed and locked.

d. Fit. Outer door shall be stepped or tongued and grooved, or both, in order to protect against fire, smoke, and water.

Important doors should have doors and jambs ground to a fit, should be provided with packing, and such doors and jambs should be tested for waterproofness after erection.

It is suggested that packing may advantageously be provided on inner doors as additional protection.

e. When double doors are used, inner doors shall be of steel plate, at least ½ inch thick, reinforced to give stability, and provided with suitable locking mechanism.

NOTE.—It is the principal function of inner doors to create a dead space for insulation. It is hardly likely that they will be called upon to resist much heat.

f. Air space between inner and outer doors shall be at least 12 inches.

7. *Interference Mechanism*

Shall be provided so as to make it necessary to close inner doors before outer ones; otherwise the outer doors shall be constructed in accordance with Rule 6, *a*, for single doors.

8. *Water-Tightness*

Walls, roof, and floors to be effectively waterproofed, but no combustible material shall be used for this purpose.

NOTE.—Investigations have shown that it is possible to make concrete effectively waterproof by using the proper materials and proportions so as to get the densest mixture. This method is therefore advocated. Covering with a mastic of felt and tar (often advisable between lining and concrete) is obviously not feasible on the outside of a vault which may be called upon to withstand assault by fire, except that if brick protecting shell is provided for concrete such waterproofing may be placed over concrete.

Where vaults are located in basements or at other low points, special provision to prevent entrance of water, such as raised sills, large area floor drains for basement, and packing in grooves may be warranted.

Storage vaults often can have raised sills without inconvenience. Operating vaults, where travel through openings, including that by trucks, is frequent, usually cannot have a sill more than a few inches high, even where provided with a sloping approach.

Where there is a possibility of water entering vaults, contents that can be damaged by water should not be placed close to the floor.

9. *Ventilation*

Ventilation of interior shall be only through doors. Walls, floors, and roofs shall not be pierced. For large vaults, inside permanent duct systems, fed by temporary section of ducts when doors are open, are used.

10. *Interior Equipment*

Shelving, stairs, book lifts, and all other interior equipment shall be entirely of metal. Designs embodying compartments with doors shall be used for the storage of papers or other combustible materials.

11. *Lighting*

a. Shall be by electricity only, and wiring shall be installed in accordance with the National Electrical Code.

b. Where possible it is recommended that current be secured through a cord carried from an inside connection to an outside one and after the opening of the door.

c. If wiring enters the vault except through the door opening, it shall enter the vault wall near the floor, be encased near the outer surface of the wall to a point near the ceiling of the vault, and then enter the vault.

d. The closing of the door shall automatically cut off current except that some emergency lighting may remain in service, and that provision may be made for telephone, annunciator, and alarm connections.

e. Pendent cords shall be avoided. If used, they shall be of reinforced type, and lamps shall have guards.

Class B Vaults

Vaults usually erected in tiers and designed to afford a large measure of protection to their contents, assuming even the total burn-out of the building in which vaults are located.

1. *Area*

Inside floor area shall not exceed 150 square feet. Height will naturally be similar to that of stories where a tier of vaults is built.

2. *Material*

a. Concrete or brick. Reinforced concrete of same quality specified for Class "A" Vaults, or hard burned brick laid in Portland cement mortar shall be used.

b. Reinforcement. Rolled beams or rails are frequently used for floor and roof reinforcement and are occasionally used in walls as well, both to secure fire and burglar-resisting powers. They are advised in the case of roofs because of their impact-resisting powers.

c. Continuous Construction. The principles laid down for Class "A" Vaults shall be followed where reinforced concrete is used.

3. *Walls*

a. Support. Shall preferably be built on the ground (on rock if possible), and shall have footings capable of carrying the load without danger of settling.

Where walls do not rest upon the ground they shall rest upon steel framework, which is insulated against heat with concrete in the same manner specified for Class "A" Vaults.

b. Independence. Shall preferably be independent of the walls of the building, but, if not, shall be effectively bonded to the building walls.

NOTE.—Attention is called to the fact that the method of building a vault wall against the outer wall of building, and omitting bonding, will not insure the integrity of the vault, and that vault walls erected after the building are likely to settle and break connection with building walls. Also falling building walls may tear away wall used jointly for building and vaults, and cause failure of vault.

c. Thickness. Concrete walls shall be not less than 12 inches thick for three upper stories, and not less than 16 inches thick for next three stories below. Brick walls shall be not less than 16 inches thick for three upper stories, and not less than 20 inches thick for next three stories below.

d. Carrying of Floors. Building floors shall preferably not be carried by vault walls, but if so carried the wall thickness at no point to be less than 12 inches in the case of concrete and not less than 16 inches in that of brick, and floor beams shall be self-releasing.

4. *Roof*

a. Thickness. When of reinforced concrete, shall be not less than 12 inches thick, and, where top of vault is below roof of building, thickness may need to be increased to provide strength to resist impact.

Brick arch roofs, while not objectionable, are not recommended. If used, minimum thickness of arch shall be 16 inches. Tie rods may be needed.

b. Strength. Shall have strength of spans consistent with surrounding conditions, especially possible impact of falling bodies, such as walls, safes, and machinery.

5. *Floors*

a. Thickness. Shall be not less than 8 inches thick if reinforced concrete, and not less than 12 inches thick if brick arched.

b. Flooring. No combustible flooring shall be used.

6. *Doors*

NOTE.—These specifications closely follow the National Board of Fire Underwriters' Regulations for the Installation of Fire Doors and Shutters, in so far as material and assembling are concerned.

a. Door frames

1. To be made of 4 x 3 x 3/8-inch angle iron, or of 4 x 3/8-inch bar iron stiffened with 1 1/2 x 1 1/2 x 1/4-inch angle iron riveted on the back.

The latter frame is more suitable for flush doors.

2. Wall frames to be provided on both sides of wall.

3. The bottom pieces of frame to project 2 inches above the floor.

4. Each set of wall frames to be connected by bars of 1 1/4 x 1/4-inch iron, spaced not more than 24 inches apart all around, except where sill acts in place of bars, or by 5/8-inch bolts through wall and spaced not over 24 inches apart.

5. Connections of 1 1/2 x 1 1/2 x 1/4-inch angle iron in the corners can be used to advantage when angle iron wall frame is used.

6. Top and bottom pieces of wall frame to be joined to side pieces by wide splice plates of 3/8-inch iron securely riveted in place.

7. Sills to be of iron or steel and raised not less than two inches above the floor on each side of wall. In all cases the sills must rest directly on the concrete floor, and be attached to the wall frame.

b. Door Plates and Panel Frames

1. Door plates to be of 1/4-inch iron or steel, and thoroughly straightened. Single plates to be used wherever practicable.

2. Where two plates are used, the joints to be reinforced by 3 x 1/4-inch strip or splice plates securely riveted to each plate. Rivets on splice plates to be staggered, not to exceed 9 inches apart on each plate.

3. To overlap wall frame at least one inch on all sides; or, if doors are flush, to be set into at least 5/8-inch rabbet all around, formed by an angle on back of wall frame.

4. Door plate to be securely riveted to the panel frames and panel bars.

5. Panel frames to be made of 2 x 2 x 1/4-inch angle iron, continuous with bent corners, or with welded corners, or with corners reinforced by fillet angles. Fillet angles to be securely riveted in place. Panel frames of equivalent cross section and stiffness may be used.

6. To be stiffened with 2 x 2 x 1/4-inch angle iron panel bars with ends offset so as to extend over sides of frame, or ends may be fastened with fillet angles. Each frame to be provided with at least two panel bars.

7. Panel frame to be placed as near edges of door plates as practicable.

c. Riveting. Rivets to be of Norway iron, 3/8 inch in diameter, and placed not over 6 inches apart. Steel rivets should not be used.

As the fire-resisting qualities of the iron door depend largely on proper riveting, the rivets should be properly placed and carefully drawn up. If rivets are to be flush, holes must be liberally countersunk.

d. Hinges

1. Doors to be hung to wall frame by at least three

wrought iron hinges, care being taken to install them in exact alignment.

2. Hinges riveted to wall frame should be at least 4 x 3 inches and made of ⅜-inch iron or heavier. To be fastened by at least three ⅜-inch rivets.

3. Hinges on doors to be constructed of 2 x ⅜-inch bar iron. Upper and lower hinges to extend across the door to panel frame on opposite side. Center hinge should extend at least one-half the distance across the door. All hinges should be securely riveted to the door plates and through panel plates on side.

4. Pins to be at least ⅝-inch turned steel.

e. Latches

1. Doors to be secured by at least three latches of 1½ x ⅜-inch iron, working together. Upper and lower latches not to be more than 12 inches from upper and lower edges of door opening.

2. To be operated from either side of door, swing freely on ⅜-inch pin or rivet, be provided with proper keepers securely riveted on the outside of door, and with proper spring to insure latching.

3. To freely enter catchers made of ½-inch Norway iron securely riveted to the wall frame.

f. Slide Bolts

1. Where sets of sliding bolts, passing through door frame, engage wall frame, the above sections covering hinges and latches may be modified as follows:

2. There shall be at least two hinges of 2 x ¼-inch material, or heavier, secured both to door and to door frame by at least two ⅜-inch rivets in each case.

3. The sliding bolts must pass through door frame and enter wall frame on both sides of door, and for a distance of at least ⅝ inch.

4. Bolts shall be of steel at least one inch in diameter, and distance between bolts, and between bolts and the top and bottom of door, not more than 18 inches.

5. In addition, there shall be at least one bolt engaging at the top and one at the bottom of the door.

g. Inner Doors

1. Plates to be not less than ⅛-inch iron or steel. Plates to be reinforced around all edges with 1½ x ¼-inch bar iron, or equivalent, secured with rivets at least ¼ inch in diameter and spaced not over 9 inches on centers.

2. Doors to be provided with at least two hinges each, material to be not less than 1½ x ¼ inch, secured with at least two rivets to both frame and door.

3. Latches to engage at top and bottom, and at least at one point on meeting edges of doors. Doors to fit frames tightly.

h. Air Space. Between inner and outer doors there shall be at least 12 inches of air space.

7. *Interfering Mechanism*

Shall be provided so as to make it necessary to close inner doors before outer ones; otherwise the outer door shall be at least six inches thick and contain at least four inches of concrete filling or its equivalent.

8. *Water-Tightness*

Same as for Class "A" Vaults, in so far as concrete construction is concerned.

9. *Ventilation*

Same as for Class "A" Vaults.

10. *Interior Equipment*

Same as for Class "A" Vaults.

11. *Lighting*

Same as for Class "A" Vaults.

Class C Vaults

Vaults carried on the framework of fire-resistive buildings, and designed to afford a large measure of protection to their contents, assuming the integrity of the supporting structure.

When vaults are erected upon the framework of fire-resistive buildings, the safety of such vaults is directly dependent upon the fire-resistive qualities of the buildings. Vaults built in vertical lines make it possible to provide particularly good fire-resistive construction for bays in which such vaults are located.

1. *Size*

Inside floor area shall not exceed 100 square feet.

Clearance between top of vault and lowest structural member of floor above shall not be less than 12 inches, and space between top of vault and floor above shall be closed up with non-combustible material which will readily crush in event of deflection of floors.

2. *Material*

Shall be of reinforced concrete of the same quality as specified for Class "A" Vaults.

Reinforcement for concrete shall consist of steel rods at least ½ inch in diameter, spaced 4 inches on centers and running in both directions at right angles to each other. These rods shall be securely wired together at intersections not over 12 inches apart in both directions, and be installed centrally in each wall.

Any other form of reinforcement, of equal or greater cross section, may be used.

3. *Walls*

Thickness. Shall be at least 8 inches thick.

4. *Roofs*

a. Reinforcement. Same as for floors.

b. Thickness. Shall be at least 8 inches thick, and the top of any vault one or more stories below the roof of the building in which it is located shall be at least 12 inches thick, providing there is no other vault immediately above it.

c. Independence. Roofs of vaults shall be independent of floors, roofs, or ceilings of buildings.

5. *Floors*

a. Floors of vaults may serve as floors of buildings provided the reinforcing material is protected with at least 2 inches of concrete.

b. Thickness. Shall be at least 8 inches thick.

c. Flooring. No combustible flooring shall be permitted.

6. *Doors*

a. Single doors, not less than 8 inches thick, and containing not less than 3 inches of concrete, are considered desirable for this class of vault. By means of packing and a pressure mechanism considerable water-tightness can be secured. Otherwise the double type of door shall be used, as per the Class "B" Vault specification.

b. Air Space. Between inner and outer doors there shall be at least 12 inches.

7. *Interfering Mechanism*

Same as for Class "B" Vaults.

8. *Water-tightness*

Protection against entrance by water shall be secured in similar manner to that outlined for Class "A" Vaults, in so far as concrete work is concerned.

9. *Ventilation*

Same as for Class "A" Vaults.

10. *Interior Equipment*

Same as for Class "A" Vaults.

11. *Lighting*

Same as for Class "A" Vaults.

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Building Officials Conference Resolutions

AT the annual meeting of the Building Officials' Conference, recently held in Chicago, the following excellent resolutions were passed:

"*Resolved,* That discretionary power should be vested in building officials to vary or modify the law, where practical difficulties arise in its literal enforcement, so that the intent of the law is secured; and that in case the building official declines to exercise such discretionary power an appeal should be to a board of technical experts."

"*Resolved,* That proper means of egress from every building should be provided in the form of enclosed stairways; that outside metal fire-escapes should not be considered as a required means of egress from new buildings, and that their use should be confined to existing buildings where other means of egress are impracticable; and that wherever such fire-escapes are used the opening thereon should be protected by metal sash and wire glass, or by fire-resisting doors with proper fusible links."

The matter of vesting building officials with discretionary power where practical difficulties arise in the literal enforcement of building laws is an exceedingly sensible and timely move; and it is to be hoped that the various law-making bodies before which this question may be argued will appreciate the benefit which the building fraternity and the community will derive from such action.

The problem of providing proper means of egress from every building has been clearly met and disposed of in the second resolution.

The danger of outside metal fire-escapes where the opening thereon is unprotected has been demonstrated many times; and the recommendation of the Conference that such openings shall be protected by metal sash and wire glass or by fire-resisting doors with proper fusible links has distinct value.

Many Cities Represented

Interesting discussions of such topics as the use of terra-cotta blocks, gypsum products, metal lath and wood shingles were discussed at length by various officials present, among whom were Rudolph P. Miller, of New York City (elected to serve as chairman of the Conference for the next year); James G. Houghton, Building Inspector of Minneapolis (elected vice-chairman); Sidney J. Williams, State Building Inspector of Wisconsin (elected Secretary); Superintendent Carlin, of Brooklyn, and Building Commissioner Forbush, of Newton, Mass. (elected members of the Executive Committee). Also present were Deputy Commissioner of Buildings Knight, of Chicago; George E. Rendigs, Commissioner of Buildings of Cincinnati; Fred W. Loomis, Building Commissioner of Springfield, Mass.; S. A. Dies, Superintendent of the Bureau of Building Inspection of Pittsburgh; S. N. Kielley, Building Inspector of Duluth; Jacob Hilkene, Commissioner of Buildings of Indianapolis. New York had a particularly good representation in Superintendents of Buildings Carlin, of Brooklyn; Moorehead, of the Bronx; Moore, of Queens, and McDermott, of Richmond.

It has been decided to form a more permanent organization of the Conference, and officials of any department or bureau administrating laws or ordinances affecting building construction and safety from fire will find connection with the Conference of distinct value. Those interested will be fully advised by communicating with the New York office of CONSTRVCTION.

The Editor's Page

IN the busy hours of every day
We pause—
To analyze and weigh
A striking word, or deed, or
thought.

Associated Effort in the Wire Glass Industry

IT is interesting to note the increasing recognition of the value of co-operative work among the manufacturers of materials and devices which enter into the construction and equipment of consistently planned buildings.

In the article by Rudolph P. Miller, which appeared in the February issue of CONSTRVCTION, the maker of the building code of New York city pointed out clearly the value of associated efforts on the part of the manufacturers to obtain proper recognition of their particular material or device from building officials.

It is but reasonable to believe that strong associations of manufacturers of the same product can be so conducted that their particular material or device may be brought intelligently before the building public and the makers of laws and building codes.

A proper conception of the merits of any material can be gained only by a careful study of the results of practical tests of the material; and a nation-wide use of this material can be encouraged by bringing the proven merits of the material before the public in a clean and businesslike manner. Much time is wasted and many sales are lost because of this lack of co-ordinated effort, and by setting up claims which cannot be proven and in many cases can be disproven by other manufacturers.

The cement industry offers a striking example of the value of associated effort. The Portland Cement Association put that industry on its feet by an intelligent publicity campaign for *cement*. This is what a manufacturers' association is for; and there are several branches of the fireproofing industry which would benefit considerably by the formation of an association to bring their product before the building public and to keep it there.

Perhaps chief among these are the manufacturers of wire glass.

There are at least five large concerns engaged in the manufacture and sale of wire glass, but there exists no organized propaganda to further the interests of the industry. Where can information on the subject be obtained? How is the public to arrive at proper conclusions as to the value of wire glass and correct practice in its use? From the individual manufacturers?

Wire glass has a distinct place in the construction of consistently firesafe buildings and has created an enviable record as a fire retardent. An association of wire glass manufacturers, formed for the purpose of presenting to the building public the merits and uses of their product, will prove a welcome addition to the fireproofing fraternity.

The Shame of Augusta, Ga.

"SHINGLE ROOFS WIN VICTORY IN COUNCIL"

Augusta Chronicle, March 7, 1916

Further emphasis as to the need of efficient organization on the part of manufacturers of incombustible roofing materials was afforded at Augusta, Ga., some days ago, when the city council, impressed by the energy and splendidly marshalled forces of the lumbermen, decided to extend the corporate limits in which the criminal wood shingle covering may be used.

Fire Chief Reynolds, the man of all others best fitted to pass judgment upon the fire menace of the wooden shingle, strongly urged their abolition, and several of the incombustible roof dealers presented arguments in support of Chief Reynolds' position, but their statements had little weight as against the well-organized and energetically conducted campaign of the local lumber and allied interests, directed as it was by the powerful Georgia Lumber Association.

Until the organized force of the wood shingle industry is met by similar cohesion on the part of the incombustible roof men the progress of sane roofing throughout the country is destined to be slow.

A reduction of over $20,000,000 in the fire waste of the country last year, compared to the record of 1914, affords convincing proof of what may be accomplished by proper building practices and the use of approved protective devices in existing structures. Let all interested continue the safety from fire movement during 1916 and succeeding years.

First American Complete Building Show a Big Success

Cleveland Establishes Remarkable Record and Sets Splendid Example for Other Cities

Almost a Million Dollars Invested in 200 Exhibits by 600 Firms

RALPH P. STODDARD
Secretary of Society Advocating Fire Elimination and Associate Editor of CONSTRUCTION
Manager of Complete Building Show

AMERICA'S First Complete Building Show, national in its attraction, in its relation to every type of construction, in its significance as a concrete illustration of the tremendous power of co-operation and in its lesson for the future, opened in Cleveland, Ohio, on February 16th and closed ten days later—such an achievement in building construction publicity that it establishes a standard for every large city in the country to follow and a goal for them to reach.

Brevity is mighty good—in its place; but there are times when brevity, much beloved and followed as it is in American life, falls far short of sinking a thought in to the point of actual realization. We require true details. Take for example "co-operation": the school books used to tell us that to "co-operate is to act or operate jointly with others." But say!—when we take that definition and link it up with the Cleveland Complete Building Show they just don't harmonize. Like ham and eggs and a choice cut of roast Vermont turkey—both are good, but which would you reach for!

Brevity aside for the moment (and taking a long breath) here is an up-to-the-hour definition of *co-operation*: Co-operation is that which results when the men back of the Society Advocating Fire Elimination decide to get together "to operate jointly with others" to run the first American Complete Building Show, to engage the biggest place in their home town in which to run it, to get six hundred firms to put up almost one million dollars in some two hundred exhibits, to have Mayor Davis ring up the curtain and incidentally find the affair so good that he returned on four different occasions and his cabinet came back a couple of times or more to "see the show over again," to have more than forty-six hundred builders from out of the city attend, to attract practically every one of prominence in and about Cleveland with nearly all of the Cleveland Chapter of Architects and more than four hundred members of the Cleveland Builders' Exchange, to see over ten thousand visitors register at one exhibit and get a total attendance of very close on to 127,000 people representing an intensely interested public and all the interests related to building planning, construction, furnishing, maintenance, equipment and protection, and to do a whole lot of other mighty good things, such as bringing so many out-of-town visitors as to tax the city's hotel capacity, and to make the people, the home owners and those who are building homes and those who are thinking seriously of building a home and those who hope sometime to own a home, yes, and architects and engineers and contractors, see firesafe construction in a way they never saw it before, and to do all this without any hot air stunts or blue sky ballyhoo—well, now, brother, that's what the twentieth century calls *CO-OPERATION.* And now brevity steps in and makes its just demand for recognition

The romance of twentieth century construction, the distinctly American science that has made possible skyscrapers and the modern city, factory and residence, unfolded itself in a vast dream city in miniature at the Show. The latest chapter in the age-epic of shelter, with its many modern phases in homes and business structures, showed forth from the wide variety of exhibits illustrating the last word in utility, comfort and safety. Tile, iron and steel, brick, cement, stone—every modern agent of efficient construction did its part in a grand way to make the Complete Building Show worthy its name—"complete"!

Then came Mayor Davis followed by his cabinet, the city council and a procession of architects, builders and business men. Formal ceremonies consisted of a thorough inspection of all the exhibits, and speeches by Ralph P. Stoddard, secretary of the Society Advocating Fire Elimination, associate editor of CONSTRVCTION, and manager of the Show; W. A. Fay, president of the Complete Building Show Company, and Mayor Davis.

The Coliseum was sectioned off into a series of streets with names taken from various cities. The New York visitor felt at home on Broadway, which was the main thoroughfare of the Show. Boston's Tremont Street, Washington's Pennsylvania Avenue, Hennepin Avenue, of Minneapolis, Buffalo's Delaware Avenue, and famous streets of other American cities were located in the network of cottages, lawns and porticos.

A substantial, matter-of-fact atmosphere, thoroughly utilitarian but none the less ornamental and artistic, marked all the exhibits. Brick and stone worked into attractive designs revealed their purpose in the porches, the fireplaces, the fences and pavements. Tiles, terra cotta and cement-concrete products were exhibited in the houses and examples of larger construction.

Of the individual exhibits the Dutch Kitchen was the greatest magnet for the crowds. There was an immense Dutch fireplace, before which sat three Dutch maids. This exhibit was the work of a brick concern, and as a reproduction of the early Colonial living room it was perfect.

A picture show demonstrated the evolution of lime from the ground to the finished product.

The contest for a $6,000 house and lot on Lake Shore Boulevard excited continuous interest, and practically every visitor at the Show became a contestant. Another interesting feature was the method of winning the house and lot, which will go to the person suggesting the best title for an unnamed crayon drawing, depicting a young couple surveying building operations on their future home.

An art gallery, with paintings by local artists, demonstrating the application of mural colorings to house decoration, occupied one corner of the Coliseum.

Another art gallery contained 150 plans and specifications for a model $3,000 house, entered in competition by architects throughout the country. The winning plan is worked out on actual size, with the ground floor rooms completely furnished. All the prize-winning plans appeared in the February number of CONSTRVCTION.

There were special days for the Cleveland Engineering Society, the Cleveland Real Estate Board, the Architectural Club, the Rotary Club and other organizations.

The East Ohio Gas Company (Standard Oil Company), while not an exhibitor, generously ran a monster display advertisement commending the Show for the pronounced educational work it was doing and advising attendance on the part of the public.

While the makers and dealers in firesafe materials played absolutely fair, it was a triumph for their products. The lumbermen are entitled to great credit for the way they managed their displays. Still the fact remains that the firesafe materials were presented in a way that carried the Show for them in open competition with lumber and entirely without any invidious comparisons.

The lumbermen's Washington Birthday parade and the flag raising before the model of Washington's Mount Vernon home (in lumber) was a splendid drawing card and did much toward promoting the popularity of their exhibit. Their guessing contest for various woods and a popularity contest for one of the model houses proved excellent publicity for them. Their displays of rare hard woods for interior and furniture purposes were among the most artistic in the Show.

The safety appliance and equipment exhibits were interesting to the Show goers. Among these was a sprinkler system, encased in glass, which was operated by heat generated by oil-soaked waste.

Fire-resistive doors, trim, windows and furniture were well represented.

The fact that a great majority of the architects in the $3,000 House Contest chose safe products as mediums for their house designs constituted an unconscious victory for safe home construction.

The sincerest praise and heartiest congratulations are due both to Ralph P. Stoddard, under whose able management the Show terminated a signal success, and to the members of the Society Advocating Fire Elimination, who had that vision and initiative which changed a thought, an idea, into a progressive and highly successful enterprise.

"I labor to make men think rather than to read my books." So spoke Montesquieu. If ever an accomplishment should provoke constructive thought from firesafe building interests, teaching them the unbusinesslike waste of time, effort and money, the folly and the pettiness of friction amongst themselves and their industries, and the magnificent possibilities of sane co-operation, of getting together, of uniting forces and separated units, of shaping the many loose ends of the "fireproofing fraternity" into a real, live, workable FIRESAFE FRATERNITY laboring intelligently for the goal which they are now separately striving for—*firesafe building construction*—surely the very real achievement of the first American Complete Building Show offers a shining example of what co-operation does and what opportunities the future holds for consistent fireproofing throughout the country!

* * *

Detroit Approves Hollow Tile

Thanks largely to the clear presentation of the merits of hollow tile made before the Building Committee of the Detroit, Mich., city council a short time ago by Charles T. Harris, secretary of the Hollow Building Tile Manufacturers Association, that product is now given proper recognition in Detroit's building code. The code amendment, as recently adopted and now effective, reads:

Sec. 3. *Tile.* All tile for floor or wall or for fireproofing purposes shall be made of pure clay, well burned, free from undue warping and cracks, with webs and flanges not less than five-eighths (5/8) of an inch thick and with rounded fillets at all intersections, provided that webs less than five-eighths (5/8) inch thick may be used if the vertical height is less than five (5) times the least width, but such webs may not be assumed to transmit pressure to a mortar bed. No tile shall be used which absorbs more than twelve (12) per cent of its weight of water fully immersed.

Tile shall be known as either hard, ordinary or soft. Hard tile shall have a crushing strength of not less than two thousand seven hundred and fifty (2,750) pounds per square inch of net section when tested with the cells vertical and not less than two thousand (2,000) pounds per square inch of net section with cells horizontal. Ordinary tile shall have a crushing strength of not less than one thousand seven hundred and fifty (1,750) pounds per square inch of net section with cells vertical and one thousand (1,000) pounds per square inch with cells horizontal and shall have not more than sixty (60%) per cent hollow space. All other tile shall be considered soft and shall not be used in bearing walls.

Where concentrated loads bear on hollow tile walls, the wall shall be made solid at the top by use of brick or by filling the voids in the tile with concrete for a space not less than six (6) inches deep and four (4) inches wide for every ton of concentrated load. This solid bearing shall extend the width of at least one tile and shall not be less than two (2) inches thick and eight (8) inches wide in any case.

Section 8 of Article 10 of the same code has been amended as follows:

Sec. 8. *Hollow Tile.* Hollow tile meeting the requirements of Article IX, Section 3, may be used in construction of bearing, enclosing and partition walls under the following conditions:

(a) The thickness of wall shall not be less than given in Article XVI, Section 2.

(b) The working stress shall not be greater than that given in Section 5 of this article.

(c) Hard tile may be used in buildings not to exceed two (2) stories in height, above the first floor level.

(d) All tile shall be laid in mortar not inferior to that specified in Section 5 of this article. All tile shall be thoroughly bonded, one to another, both vertically and longitudinally, joints staggered and filled with mortar. No broken tile will be allowed. The vertical webs of one shall be set directly over the vertical webs of the adjacent tile below, except when laid as in Section E. The stress shall not exceed one hundred and sixty-seven (167) pounds per square inch of net section with cells vertical. Only the webs in vertical alignment with the webs above and below will be assumed to carry load. No cutting of blocks will be allowed to admit pipes in bearing walls unless two webs remain unattached or filled in solid with concrete. The metal fabric hereinbefore specified may be omitted in non-bearing or curtain walls with voids horizontal.

(e) Tile walls faced with brick shall have a header course every eighth course, but not to exceed twenty-four (24) inches, otherwise the brick facing shall not be regarded as part of the wall.

(f) In calculating stress, only these vertical webs in vertical alignment with vertical webs below may be considered as carrying load.

Nitro-Cellulose Motion-Picture Films

The safe storage and handling of motion-picture films, which are of a highly inflammable nature, have been carefully regulated by the National Board of Fire Underwriters. These regulations, recommended by the National Fire Protection Association, will be of direct interest and value to that part of the building fraternity which has to do with the design and construction of buildings in which such films are stored or used.

NITRO-CELLULOSE motion-picture films should preferably be stored in a separate building or vault, not exposing other property or occupancy; if a limited quantity is permitted in a building with other occupancy or in an exposed building, it must be in standard fireproof vaults, safes or cabinets.

1. *Film Reels.*—Each reel of film shall be kept in a separate metal can with tight-fitting cover, except when in use.

NOTE.—A reel ordinarily contains 1,000 feet of film 1 11/32 inches wide, and weighs about 5 pounds; diameter of reel is approximately 10 inches.

2. *Vaults.*—Where the maximum degree of protection for valuable films is the primary consideration, vaults shall be constructed according to requirements for Class "A" Vaults. This type of vault involves massive construction designed to resist long-continued fire, impact of falling bodies, and attack by burglars (in so far as this feature can properly be incorporated in these specifications).

Where the primary consideration is to minimize the fire hazard in a building incident to the films therein, vaults shall be constructed in accordance with the requirements for Class "A," "B" or "C" Vaults.

(See separate specifications for Vaults.)

No one vault or compartment shall exceed in size 750 cubic feet.

To prevent abnormally high temperature within the vault glass windows and skylights should be avoided; likewise proximity to boiler stacks and similar sources of heat.

Automatic sprinklers should be installed inside each vault.

Other vaults of not more than 150 cubic feet capacity, and of a construction approved as at least the equivalent of that described for safes, may be accepted in lieu of safes; or vaults having a capacity not exceeding 50 reels of film each, and approved as at least equivalent of that described for cabinets, may be accepted in lieu of cabinets.

3. *Safes.*—Size shall not exceed 150 cubic feet. Safes shall have an angle iron frame at least ¼ x ¼ x 2 inches and continuous at all edges. On safes larger than 40 inches high, 30 inches wide, and 30 inches deep, an additional stiffening of heavy steel at least ¼ inch thick, and of width proportioned to size, but never less than 2 inches, shall be used at top, bottom and sides. Sheet steel plates shall be not less than No. 12 U. S. gauge for the outer shell, and not less than No. 14 for the inner shell. Filling shall be of cement concrete or its equivalent not less than 5½ inches thick, except that the doors may have at least 4 inches of concrete with a sealed air space for the lock and bolts. Door shall have stepped sides so as to be smoke proof. No cast iron shall be used in the construction of the safe, except such parts as casters, hinges and flanged door frames. Other containers of no more than 150 cubic feet capacity and approved as the equivalent of above-described safes may be accepted in lieu thereof.

4. *Cabinets.*—Two hundred reels of film weighing not more than one thousand pounds in the aggregate may be stored in cabinets, but no one cabinet shall contain more than 50 reels (250 pounds). When two or more cabinets are used they shall be in a separate room with outside ventilation and enclosed by fireproof partitions with fire doors of the vertical-shaft type at communications. There shall be at least 10 feet clear space between cabinets unless an incombustible shield is provided at each side of each cabinet extending 2 feet beyond cabinet in all directions, in which case the distance between cabinets may be only 4 feet.

Cabinets shall be tightly enclosed and may be made of suitably stiffened sheet iron at least No. 18 U. S. gauge, in thickness, double walled with 1½ inches of air space; doors shall be constructed equivalent to walls of the cabinet, shall be self-closing, fit closely and be kept locked.

Other containers having a capacity not exceeding 50 reels of film each and approved as the equivalent of the cabinets may be accepted in lieu thereof.

5. *Pressure Relief for Vaults and Safes and Cabinets.*—Each container for film storage shall be pro-

vided with a pressure relief vent opening to the outside of the building, directly through an exterior wall, or through a separate stack with walls of reinforced concrete or brick at least 5 inches thick and shielded at top. The effective sectional area of the opening shall be at least 70 square inches for each 100 reels (500 pounds) of film capacity. The capacity of vaults shall be rated at three reels per foot of cubical contents; the capacity of safes and cabinets, or small vaults without aisle space, shall be rated at six reels per foot of cubical contents. Reels shall not be placed near enough to vent opening to reduce its effective area. A permanent guard shall be installed to prevent films from being forced against the vent openings of small containers. In fireproof buildings horizontal ducts may be permitted to connect the relief openings in vault separately to the outside of the building, provided the walls are made of solid masonry at least 5 inches thick and securely supported. A riveted sheet metal pipe of at least No. 18 U. S. gauge in thickness may be permitted to separately connect the vent opening of each cabinet to the outside of the building, provided the pipe is covered with at least 1 inch of approved heat insulating material. Such pipes shall not be nearer than 9 inches to combustible material.

Each pressure relief vent shall be protected against the weather by thin glass (1/16 inch thick) painted a dark color or by other incombustible fragile material in a sash arranged to open automatically in case of fire by the use of a fusible link, or thermostat placed inside the film container. The effective sectional area of the vent opening shall correspond with the actual area of the glass. No pane of glass to be smaller than 200 square inches. Muntins to be constructed as lightly as possible so as to break readily. Any protection equivalent to the above may be accepted in lieu thereof.

A light wire screen, not coarser than ⅛-inch mesh, shall also be placed over each vent at a point between the glass sash and the container, so arranged as not to interfere with the automatic operation of the sash.

The outlet of each vent shall be located at a point above the roof. Exception will be made only where a different location of the outlet will not expose other property in the same or adjacent buildings, and then only by special permission of the Inspection Department having jurisdiction.

6. *Ventilation of Vaults.*—There should be no ventilation of vaults other than a pressure relief opening, discharging directly to the outside of the building. Blower systems circulating air in the vault are objectionable, even after every reasonable safeguard has been provided.

Artificial ventilation of vaults is sometimes desired in factories handling new material, as in motion-picture film printing establishments. In such cases the additional fire hazard in connection with the ventilation may be somewhat reduced if the intake and discharge openings in the vault connect directly to the outside of the building through wall or a flue with masonry walls at least 4 inches thick. The outlet and intake openings shall not expose or be exposed by other property. Only suction blowers drawing air away from vault shall be used.

Handling of Nitro-Cellulose Motion-Picture Films

7. *Printing, Developing, Examining, Repairing and Exchange Rooms*

a. Shall have outside ventilation and be separated from each other and the balance of the building by tight partitions of fire-resistive material, with self-closing fire doors of the corridor type at communications, partitions and transoms. Doors should contain no glass other than wired glass.

b. Such rooms shall be used neither for storage nor handling of combustible materials other than the films. The furnishings should be of incombustible material.

c. The number of reels of films not in metal cans shall be limited to 20 in a single room at any one time. The number of reels of film in the examining and repairing room awaiting attention shall be limited to 10 for each operator; provided all such reels except the one under examination or repair be placed in an approved double walled No. 20 U. S. gauge metal box with at least ½-inch air space between walls. A box otherwise constructed and equivalent to the above may, by special permission, be accepted in lieu thereof. Sides of box shall extend at least 6 inches above top and beyond front and rear of box. Covers shall be self-closing and of a construction equivalent to the walls of the box. Boxes shall be separated from each other at least three (3) inches.

Rooms having more than 20 films not in metal cans during rush hours shall be sub-divided by partitions of fire-resistive material with self-closing fire doors of the corridor type at communications so as to limit the number of reels outside of metal cans to 20 in each of these sub-divisions.

d. In each exchange room approved vaults should be utilized for temporary storage and sorting of films in cans while being handled. When impracticable to use such vaults, double-walled metal cabinets of the type approved for storage purposes may be used. Each cabinet shall be properly vented to the outer air and contain no more than 50 reels. The number of cabinets shall not exceed four (4) in any one establishment.

8. *Scrap and Waste.*—All scrap or waste shall be kept under water, in self-closing standard metal waste cans or their equivalent, and removed from the building at least once each day to a safe location; such waste to be kept separate from paper waste or other rubbish.

9. *Cement.*—Any compound of collodion and amyl

acetate or similarly inflammable cements inside the building shall not exceed the quantity required each day, and shall be limited to one gallon.

10. *Motion-Picture Machines and Booths.*—Shall be safeguarded in accordance with the requirements of paragraphs 38(U) and 38(V) of the National Electrical Code. The booth may be omitted if the machines are in a separate room enclosed by incombustible partitions with self-closing fire doors of the corridor type at communications. If more than five machines are in one room, each machine shall be separately enclosed in an approved booth.

11. *Power.*—Electric motors, if used, should preferably be of the induction type without commutators, or if of the direct-current type, to have enclosed commutators. All switches, rheostats, or other current-controlling devices must be enclosed in approved dust-proof and fireproof cabinets.

12. *Lighting.*—Shall be by incandescent electric lights only; lamps, if subject to mechanical injury, to be protected by approved wire guards. Entire installation shall be in accordance with the requirements of the National Electrical Code.

13. *Heating.*—Only hot air, hot water or steam heat shall be used. The heating pipes should be preferably overhead attached to the ceiling. Steam and hot water pipes or radiators, if on side walls, shall be safeguarded by the use of sheet metal or heavy galvanized wire netting with not over ¼-inch mesh held firmly in place at least one inch from pipes; or by covering space betwen back or benches and walls with heavy galvanized wire netting, with not over ¼-inch mesh, securely stapled to bench and wall, but sloping so that it may not be used as a shelf. No hot air or other floor registers shall be used, nor shall any register be less than 6 inches above the floor.

14. *Smoking and Carrying of Matches.*—Shall be strictly prohibited.

15. *Protection.*—All buildings containing more than a total of 50 reels of films (250 pounds) shall be equipped with an approved system of automatic sprinklers. Each room shall be equipped with at least one approved hand fire extinguisher. At least one pail of water and one pail of sand shall be provided for each vault, safe or cabinet in use.

Motion-Picture Studios

The provisions herein contained for storage and handling of films should be observed in establishments where the subjects are photographed. These plants usually introduce most of the hazards commonly found in theaters, and safeguards as provided in the standard specifications for theaters should be observed as far as practicable.

New York State Industrial Commission

The State Industrial Commission has taken over the supervisory powers of the State Department of Labor; the administrative and judicial functions of the State Compensation Commission and the legislative powers of the former State Industrial Board. Under the new plan, there is an Industrial Council to act in an advisory capacity with the Commission. The Commission is the sole body with power to effectuate the advice of the Industrial Council.

Beside the enforcement of the sections of the labor law relative to fire prevention and exits, the Industrial Commission must enforce all the inspection provisions of the law; must see to it that dangerous machinery is eliminated as far as possible, at least adequately safeguarded. It must hear and determine all disputed compensation cases, supervise and administer the State Insurance Fund; investigate and pass upon all claims for compensation; intervene, arbitrate, mediate and prevent, if possible, industrial disputes between employer and employee; supervise the State Employment Bureau with its branch offices in all industrial centers of the State; act in a paternal capacity toward all immigrants arriving in and permanently located in New York State; see to it that the "One Day's Rest in Seven Law" is observed by employers throughout the State, likewise the laws relating to hours of employment of women; compel adequate sanitary precautions in factories, factory buildings and mercantile establishments; enact articles of the Industrial Code of the State puting into operation a fire-alarm signal system, a sanitary code and a dangerous machinery code for the factories of the State; supervise the tenement home-workers of the State and pass upon plans for factory construction.

Notable Pre-Historic Stone Work Found

It is announced that Government archeologists, under the direction of Dr. J. W. Fewkes, of Washington, have uncovered one of the greatest archeological finds of the century in Southwestern Colorado, in the Mesa Verde National Park. This is a cut and polished stone citadel, built by the cliff dwellers thousands of years ago. The citadel is built in the shape of an enormous D. The vertical line of the D measures 132 feet, while the circular wall measures 245 feet.

Standardizing Column Protection

WITH a view to determining "the ultimate fire resistance of representative loaded building columns and the fire-resistive value of various forms of column protection," a series of scientific tests has been planned by a joint committee representing the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters and the National Bureau of Standards.

The results of the proposed tests will be of the utmost importance to the building fraternity and all concerned, directly or remotely, in building practices, for the tests in question should authoritatively determine a number of problems in relation to building construction, concerning which a wide diversity of opinion now exists.

In reciting the purpose of the intended tests, and the elaborate methods to be employed in their preparation, the National Fire Protection Association, through its official medium, says:

"The fact that very few tests have been made under conditions approximating those of service, that available test data are incomplete, that fire experience has a limited value due to many variable and unknown factors and the existence of wide differences in requirements covering various materials used for the protection of columns, all shows the necessity for the proposed investigation.

"The columns designed to carry the lighter loads have been selected for this preliminary series of tests in the belief that the results obtained will not only furnish the necessary information relative to the lighter column sections, but will afford data that will permit the elimination of a number of variables, and simplify the investigation of columns designed for the greater loads.

"Tests in which fire streams are applied to the heated columns are not to be included in the first series of tests inasmuch as it is believed that the ultimate fire-resisting points should first be ascertained and considered in connection with the influence of the column sections and methods of fireproofing before tests are made to determine the effect of the applications of water.

"The columns that are protected by concrete, clay tile or gypsum block are to be tested in the unplastered condition, since in some types of buildings plaster is not applied, and it is believed that any investigation of the influence of the different kinds of plaster on fire resistance can best be made with the fire resistance of the unplastered member as a basis.

General Plan of Investigation

"The object of this investigation is to ascertain the ultimate fire resistance of centrally loaded columns used in the interior of buildings, under conditions approximating those of service; to ascertain the fire-retardant value of the column protection provided by the various materials and methods commonly employed in protecting columns against fire; to obtain full and accurate data that will serve as a basis for the classification of column protection for various classes of buildings; and to furnish data for guidance in the determination of proper test conditions for heavier columns, and special tests to ascertain the effect of the application of fire streams to columns while in a highly heated condition.

"Test columns consisting of the types of columns commonly employed in building construction, specially designed for the test apparatus and for safe rated loads of approximately fifty (50) tons, have been secured.

"It is proposed to protect these columns, except one of each type, by various methods commonly employed in fireproofing building columns, and to allow them to season under proper conditions for a period of six months before they are tested. See Description of Test Samples.

"It is proposed to make supplementary standard tests to ascertain the quality of the materials employed in the construction of the test columns.

"It is proposed to subject each of the columns to its safe rated load and to temperatures increasing at a predetermined rate until failure, or until the column has withstood the temperature conditions in excess of eight hours.

"It is proposed to measure and record at regular intervals during the test, the temperatures in the furnace and at various points on the surface of the structural portion of the column, the deformation and deflection of the column near the middle, and to record the results of observations relative to the effects of fire on the column and on the column protection.

"It is proposed to make careful examinations after the test and a record of the condition of the column and column protection.

"It is proposed to make photographic records of the column before and after the test, and after the column protection has been removed.

"It is proposed to make a supplementary series of tests upon additional test columns to determine the effect of the application of fire streams to columns while in a highly heated condition.

Description of Proposed Test Columns

"The types of columns to be tested include rolled steel sections, built up steel sections, round cast-iron sections, steel pipe filled with concrete, and vertically reinforced and hooped concrete columns, to which it is proposed to add several wooden columns. At least one of each of the sections is to be unprotected, others are to be partially protected by concrete, and others completely protected by various thicknesses of concrete, clay tile, gypsum block and plaster on metal lath, in accordance with the methods commonly employed in practice. The general details of the test columns and methods of covering are indicated in the schedule herewith, which also shows the position of the ceiling and floor lines of the furnace and the method of grouping the columns for comparison.

"The test columns, with the exceptions noted, are 15 feet 8 inches long between bearings. The upper 3 feet is made of extra heavy section to serve as a medium for the free transmission of the load from the ram through the roof of the furnace to the heated portion of the column. The extra heavy section is assumed to establish an effective length of 12 feet 8 inches as a basis for calculating the safe rated load of the column.

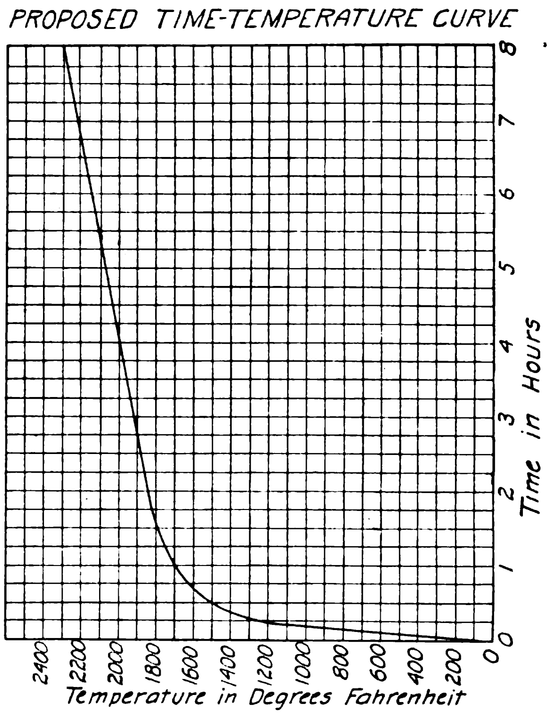
"The pipe columns and two of the cast-iron columns (Nos. 10 to 13, inclusive) are approximately 12 feet 6 inches in length and provided with square-end bearings.

"The test columns are provided with two brackets near the top to simulate the details used for beam and girder supports and conditions affecting the application of fireproofing at these points.

"The materials used in the construction of the test columns and protective coverings are to be obtained from various sources and from various sections of the country, and are to be selected with a view of obtaining those representative of their respective classes.

"It is proposed to apply the column covering in accordance with plans and specifications, drawn to secure average results obtained under ordinary commercial conditions, and to place this work in the hands of men sufficiently experienced in their particular line to obtain this result.

"It is proposed to secure representative test samples of the materials for the supplementary tests to ascertain the quality of the materials used in the construction of the columns and column coverings.



"The tests on unprotected columns are made to furnish information as to the ability of the columns to withstand fire, and to obtain information relative to the influence of the type of column section, which latter forms a basis for comparison of the various methods of column protection.

"Columns partly protected by filling the re-entrant portions with concrete are introduced as a type made necessary where space limitations prevent the use of full protection. Besides giving information on the merits of this type of protection as compared with unprotected steel, cast-iron and wooden columns, it is also thought that they will give further data on the influence of type of steel section on fire resistance. The concrete aggregates are the same as those used in the tests of the fully protected columns of the corresponding sections.

"Of the twenty tests devoted to full concrete protection, the eight made on the Rolled H section employ, with three exceptions, all of the concrete aggregates used in the full series of tests. This is done to give a comparison between the Rolled H section and the other sections with the same thickness of covering made of the same aggregate. The coverings for the same section are in general proposed to be put on in two-inch and four-inch thicknesses, from which it is thought possible to judge the performance of intermediate thicknesses.

"The tile coverings are similarly proposed to be put on in two-inch and four-inch commercial thicknesses, which consist of the designated thickness of tile plus one-half inch to one inch of mortar. The thickness of mortar between the tile and the steel sections is determined by the minimum consistent with good placement, and the attainment of as nearly a constant average mortar thickness as possible using standard sizes of tile. The thickness outside of solid flanges varies in the proposed designs from ¾ to 1-inch, and outside of lattice bars and round sections from ½ to ⅝ inch. All-clay tile is to be called for in 12-inch widths, and the distance between the horizontal joints is to be 12 inches except at the beam brackets near the top. Slabs are to be placed in all vertical joints wider than ½ inch. All cutting of clay tile is to be done with a mason's trowel, except cutting to length, which is to be done with a stone saw in the cases where the lengths specified cannot be readily obtained. The mortar for clay-tile coverings is proposed to be a 1:1:6 Portland cement, hydrated lime and fine bank sand by volume. It is proposed to place a No. 12 black annealed wire tie around each course of tile.

"The clay tile is to be of a degree of hardness acceptable for interior building work, with an absorption of not less than 10 per cent of its dry weight, as determined by drying to constant weight at 212 deg. F. and immersing in water at room temperature and pressure for forty-eight hours.

"The concrete filling is to be placed after the tile is set (except in No. 60) and is proposed to be made of the concrete materials peculiar to the region from which the tile is taken. Tests Nos. 57 and 58, as also Tests Nos. 60 and 61, are designed to study the effect of the filling of the efficiency of the covering as a whole.

"The proposed gypsum protections consist of solid gypsum tile (except for filling in Test No. 64), the sizes needed being cut from the commercial sizes with a saw, the cutting being planned with a view to using them in the most economical manner consistent with a good design. The mortar as proposed will consist of a 1:2 mixture of unfibered gypsum cement and fine bank sand by volume. Ties are to consist of ½-inch wire mesh placed in all horizontal joints and lapping at the corners.

"It is proposed to use a medium coarse lake sand, dredged from Lake Michigan, for the brown coats of the plaster on metal lath protections.

"The projecting portions of the beam brackets at the top of the columns are to be given a protection of about 1-inch thickness for all fully protected columns.

"The reinforced concrete tests, consisting of two vertical reinforced square columns, two vertically reinforced round columns, and two spirally hooped and vertically reinforced columns, are designed to show the effect of shape or column, as also the effect of type of reinforcement on fire resistance. Two inches of concrete is to be deducted all around the column in calculating the safe rated load.

"All Portland cement is to be of one brand, widely used for building construction. It is to be required to pass the requirements of the Standard Specifications for Portland Cement of the American Society for Testing Materials. The coarse aggregates are to be graded from coarse to fine, not more than five per cent shall pass a No. 4 sieve, and all are to pass a sieve having 1-inch square mesh. All proportioning of concrete and mortar is to be done by loose volume.

Description of Test Apparatus

BUILDING

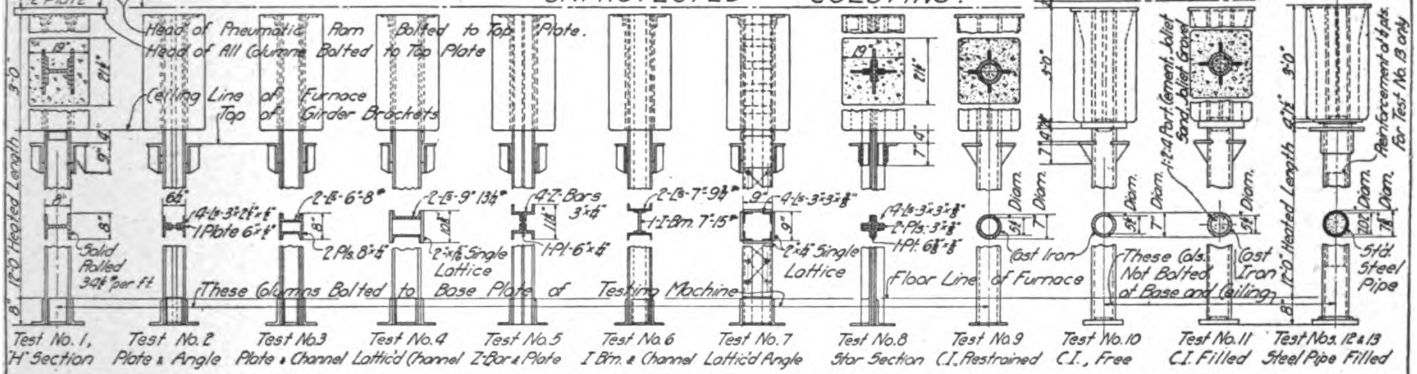
"The tests are to be made at the Underwriters' Laboratories, in Chicago, in a fireproof building specially designed for work of this character and known as Building No. 3. The central portion of the building is one high story, furnishing head room of approximately 37 feet. At three sides of this portion the building is two stories, with head room of approximately 17½ feet under the second floor. The central portion of the building is provided with six sliding skylights that can be opened for ventilation, and with a traveling crane for conveying test samples from storage into the test apparatus. The ground floor area of the building is approximately 68 by 69 feet.

APPARATUS

"The apparatus to be used in the tests is specially designed for the purpose, and consists of a carriage and traveling crane for handling the test samples, a furnace in which the columns are subjected to fire, a hydraulic ram and restraining frame by means of which the loads are applied to the columns, the apparatus for measuring the temperatures of the furnace and the test samples, the apparatus for measuring the deformation of the test samples, and a flexible nozzle by means of which streams of water are supplied in the Fire Stream Tests.

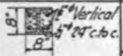
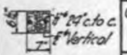
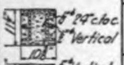
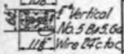
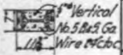
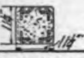
SCHEDULE OF JOINTLY CONDUCTED FIRE TESTS OF BUILDING COLUMNS

UNPROTECTED COLUMNS.

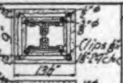
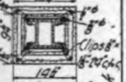
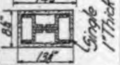
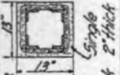
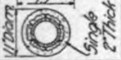


NOTE: The structural steel and cast iron sections of the partly and fully protected columns are the same as the corresponding unprotected section, the total and heated lengths of all partly protected, fully protected and reinforced concrete columns are 15'-8" and 12'-0" respectively, the general details and top and bottom anchorage are the same as for the unprotected structural steel and restrained cast iron columns.

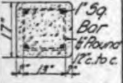
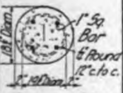
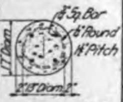
PARTLY PROTECTED COLUMNS

TEST NO. SECTION	TYPICAL SECTION	DETAILS
14 Rolled "H"		Concrete: 1-Portland Cement 2-Joliet Sand 4-Joliet Gravel
15 Rolled "H"	Same as No. 14	Concrete: 1 Portland Cement 2-Plum Island Sand 4-New England Granite
16 Plate and Angle		Concrete: 1-Portland Cement 2-Long Island Sand 4-New York Trap Rock
17 Plate and Angle	Same as No. 16	Concrete: 1-Portland Cement 3-Long Island Sand 5-Hard Coal Cinders
18 Latticed Channel		Same as No. 16.
19 Z Bar and Plate	 6½" ⅝" Vertical No. 5 B.&S. Ga. Wire 24" c.to c. 11⅝"	Concrete: 1-Portland Cement 3-Fox River Sand 5-Chicago Limestone
20 I Beam and Channel	 7" ⅝"ϕ Vertical No. 5 B.&S. Ga. Wire 24" c.to c. 11⅝"	Concrete: 1-Portland Cement 3-Long Island Sand 5-New York Trap Rock
21 I Beam and Channel	Same as No. 20	Concrete: 1-Portland Cement 2 Cleveland Sand 4-Cleveland Sandstone
22 Latticed Angle		Concrete: 1-Portland Cement 2-Fox River Sand 4-Chicago Limestone

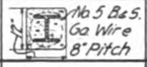
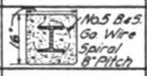
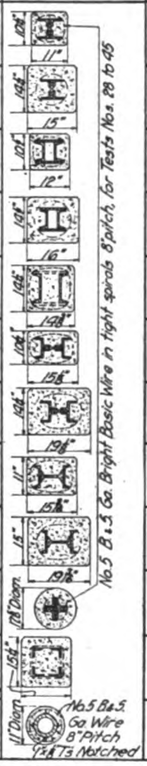
COLUMNS PROTECTED BY PLASTER ON METAL LATH

TEST NO. SECTION	TYPICAL SECTION	DETAILS
23 Plate and Angle		Plaster—1:⅓:2½ Portland Cement Hyd. Lime and Lake Sand. Inner layer to consist of two brown coats, outer layer to consist of two brown coats and one finish coat in which lime is omitted. Hair to be added to first coat. Each layer to be approx. one inch thick Metal Lath—No. 24 Diamond Mesh. Painted. 3½# per sq. yd. min. wt.
24 Plate and Channel		
25 Z Bar and Plate		
26 Latticed Angle		Same as Nos. 23 to 25 except plaster is to be in one layer 2" thick consisting of two brown coats and one finish coat.
27 Cast Iron		Plaster—Same as No. 26 except no hair is used. Metal Lath—Integral No. 26 Painted, 5½# per sq. yd. min. wt.

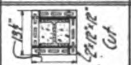
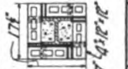
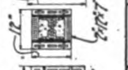
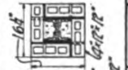
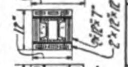
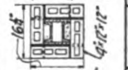
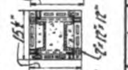
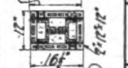
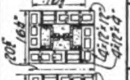
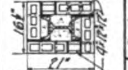
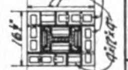
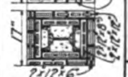
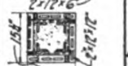
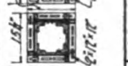
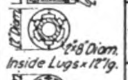
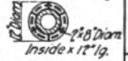
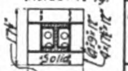
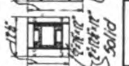
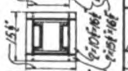
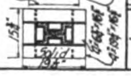
REINFORCED CONCRETE COLUMNS

TEST NO. SECTION	TYPICAL SECTION	DETAILS
68 13"×13" 4-1" Sq.		Concrete: 1-Portland Cement 2-Fox River Sand 4-Chicago Limestone
69 13"×13" 4-1" Sq.	Same as No. 68	Concrete: 1-Portland Cement 2-Long Island Sand 4-New York Trap Rock
70 14½" Diam. 4-1" Sq.	 18½" Diam. 1" Sq. Bar ¼" Round 12" c.to c. 2" 14½" Diam. 2"	Same as No. 68
71 14½" Diam. 4-1" Sq.	Same as No. 70	Same as No. 69
72 12½" Spiral Hooped Core 4-⅞"-Sq.	 ⅞" Sq. Bar ⅜" Round 1¾" Pitch 17" Diam. 2" 13" Diam. 2"	Same as No. 68
73 12½" Spiral Hooped Core 4-⅞"-Sq.	Same as No. 72	Same as No. 69

COLUMNS PROTECTED BY CONCRETE

TEST NO. SECTION	THICKNESS	TYPICAL SECTION	CONCRETE MIXTURE
28 Rolled "H"	2"		1-Portland Cement 2-Fox River Sand 4-Chicago Limestone
29 Rolled "H"	2"	Same as No. 28	1-Portland Cement 2-Long Island Sand 4-New York Trap Rock
30 Rolled "H"	2"	Same as No. 28	1-Portland Cement 2-Joliet Sand 4-Joliet Gravel
31 Rolled "H"	2	Same as No. 28	1-Portland Cement 2-Cleveland Sand 4-Cleveland Sandstone
32 Rolled "H"	2"	Same as No. 28	1-Portland Cement 2-Long Island Sand 4-Hard Coal Cinders
33 Rolled "H"	4"		Same as No. 28
34 Rolled "H"	4"	Same as No. 33	1-Portland Cement 2-Plum Island Sand 4-New England Granite
35 Rolled "H"	4"	Same as No. 33	1-Portland Cement 3-Fox River Sand 5-Chicago Limestone
36 Plate and Angle	2"	 10⅝" 11" 14⅝" 15" 10⅛" 12" 14⅝" 16" 14⅝" 14⅞" 10⅝" 15⅝" 14⅝" 19⅝" 11" 15⅝" 15" 19⅝" 17⅞" Diam. 15½" 11" Diam. No. 5 B.&S. Ga. Wire 8" Pitch 1"×⅛" T's Notched No. 5 B.&S. Ga. Bright Basic Wire in tight spirals 8" pitch, for Tests Nos. 28 to 45	Same as No. 29
37 Plate and Angle	4"		1-Portland Cement 6-Broken Tile Dust and Broken Tile
38 Plate and Channel	2"		Same as No. 30.
39 Plate and Channel	4"		1-Portland Cement 2-Meramac R. Sand 4-Meramac R. Gravel
40 Latticed Channel	2" Outside of Lattice		Same as No. 29
41 Z-Bar and Plate	2		Same as No. 28
42 Z-Bar and Plate	4"		Same as No. 28
43 I-Beam and Channel	2"		Same as No. 31
44 I-Beam and Channel	4"		Same as No. 31
45 Star Section	3"		Same as No. 29
46 Latticed Angle	2⅝" Outside of Lattice		Same as No. 28
47 Cast Iron	2"		Same as No. 32

COLUMNS PROTECTED BY TILE

TEST NO. SECTION	THICKNESS	TYPICAL SECTION	GRADE OF CLAY OR GYPSUM	FILLING
48 Rolled "H"	2" Tile, ⅜" Mortar		Low Grade Fire Clay Perth Amboy District	1:3:5-Portland Cement, Long Island Sand N.Y. Trap Rock
49 Rolled "H"	4" Tile ⅜" Mortar		Same as No. 48	Same as No. 48
50 Plate and Angle	2" Tile ⅜" Mortar		Surface Clay New England District	1:3:5-Portland Cement, Plum Island Sand, New Eng. Granite
51 Plate and Angle	4" Tile 1" Mortar		Same as No. 50	Same as No. 50
52 Plate and Channel	2" Tile ⅜" Mortar		Shale Cleveland, Ohio. District	1:3:5-Portland Cement, Cleveland Sand, Cleveland Sandstone
53 Plate and Channel	4" Tile ⅜" Mortar		Same as No. 52	Same as No. 52
54 Latticed Channel	2" Tile ⅜" Mortar		Surface Clay (1) Chicago District	1:3:5-Portland Cement, Fox R. Sand, Chicago Limestone
55 Z-Bar and Plate	2" Tile ⅜" Mortar		Same as No. 54	Same as No. 54
56 Z-Bar and Plate	4" Tile 1" Mortar		Same as No. 54	Same as No. 54
57 I-Beam and Channel	4" Tile ⅜" Mortar		Surface Clay (2) Chicago District	Same as No. 54
58 I-Beam and Channel	4" Tile ⅜" Mortar		Same as No. 57	Hollow Clay Tile 2"×12"×6" at End 3"×12"×6" at Side
59 I-Beam and Channel	2-2" Tile ⅜" Mortar		Same as No. 57	Same as No. 54
60 Latticed Angle	2" Tile ⅝" Concrete		Same as No. 54	1:2:4 Port. Cem. Fox R. Sand Chicago Limest. Filling placed before Tile is set
61 Latticed Angle	2" Tile ⅜" Mortar		Same as No. 54	No Filling
62 Cast Iron	2" Tile ½" Mortar		Same as No. 48 Lug Tile	No Filling
63 Cast Iron	2" Tile ½" Mortar		Same as No. 48 Hollow Tile	No. Filling
64 Rolled "H"	4" Gypsum Tile ⅜" Mortar		Gypsum from Central Western States	Hollow Gypsum Tile 4"×12"×30" Cut
65 Plate and Channel	2" Gypsum Tile ⅜" Mortar		Same as No. 64	Solid Gypsum Tile 2"×5"×12" Interior not Filled
66 Latticed Channel	2" Gypsum Tile ⅜" Mortar		Gypsum from Eastern United States or Canada	Solid Gypsum Tile 2"×7½"×16½" Interior not Filled
67 Z-Bar and Plate	4" Gypsum Tile ⅜" Mortar		Same as No. 66	Solid Gypsum Tile 2"×5½"×16½" at End 2"×5"×16½" at Side

Apparatus for Handling Test Columns

"The carriage is suspended by trolleys from I-beams attached to the ceiling, and is provided with lifting screws by means of which it is attached to the upper bearing plate and the column lifted while being conveyed to the traveling crane and into the test furnace. The carriage is also provided with a truck which carries the column from the crane into the furnace.

Test Furnace

"The test furnace consists of a combustion chamber 7 feet square and 12 feet high, exclusive of two shallow pits to receive falling material and carry off the water during the Fire Stream Tests. The sides are formed by two stationary brick walls, and two movable brick walls in steel panels suspended from overhead beams by trolleys. The top of the furnace consists of heavy fire clay blocks supported by a steel frame, and is partly removable to permit the installation of the test columns. The bottom is formed by the fireproofing on the steel-bearing plate and restraining frame of the loading apparatus. The products of combustion are carried off through four 13-inch flues extending from the furnace through the roof of the building. Each side of the furnace is provided with mica-glazed observation holes, so arranged near the top, middle and bottom that all parts of the test column can be observed. Observation galleries outside the furnace afford access to the upper observation holes.

"The furnace is heated by means of eight 6-inch specially designed blast burners, extending in at the corners and the middle of the sides, and arranged so that they discharge horizontally toward the center of the combustion chamber at the bottom. The burners are supplied with gas through mixing tubes connected to circulating mains located in a shallow pit under the floor outside of the furnace. Each burner is provided with valves for regulating the gas and air.

"The additional air necessary to complete combustion and distribute the fire is supplied by secondary air inlets extending through each side of the furnace at regular intervals toward the top, each inlet being provided with a regulating valve.

"Gas is supplied to the furnace through a six-inch pipe connected to the street main. Air is supplied to the burners and to the secondary inlets by means of an electrically driven blower capable of maintaining uniform air pressure.

Temperature Measurements

"The temperatures within the furnace are indicated by means of thermo-couples inserted through the walls near the top, middle and bottom. The temperatures at the surface of the structural portion of the test column are indicated by thermo-couples placed at the same levels as the furnace couples.

Deformation Measurements

"The deformation and deflection of the column during test is to be taken by measuring the movements of protected wires attached near the middle of the column. On end of each wire is attached to the column and the other is weighted and passed over an idler at a point outside of the furnace and as far from the column as the room conditions permit. The movement is measured at an intermediate point on the wires, and the true movement at the point of attachment to the column calculated from the established ratio of distances.

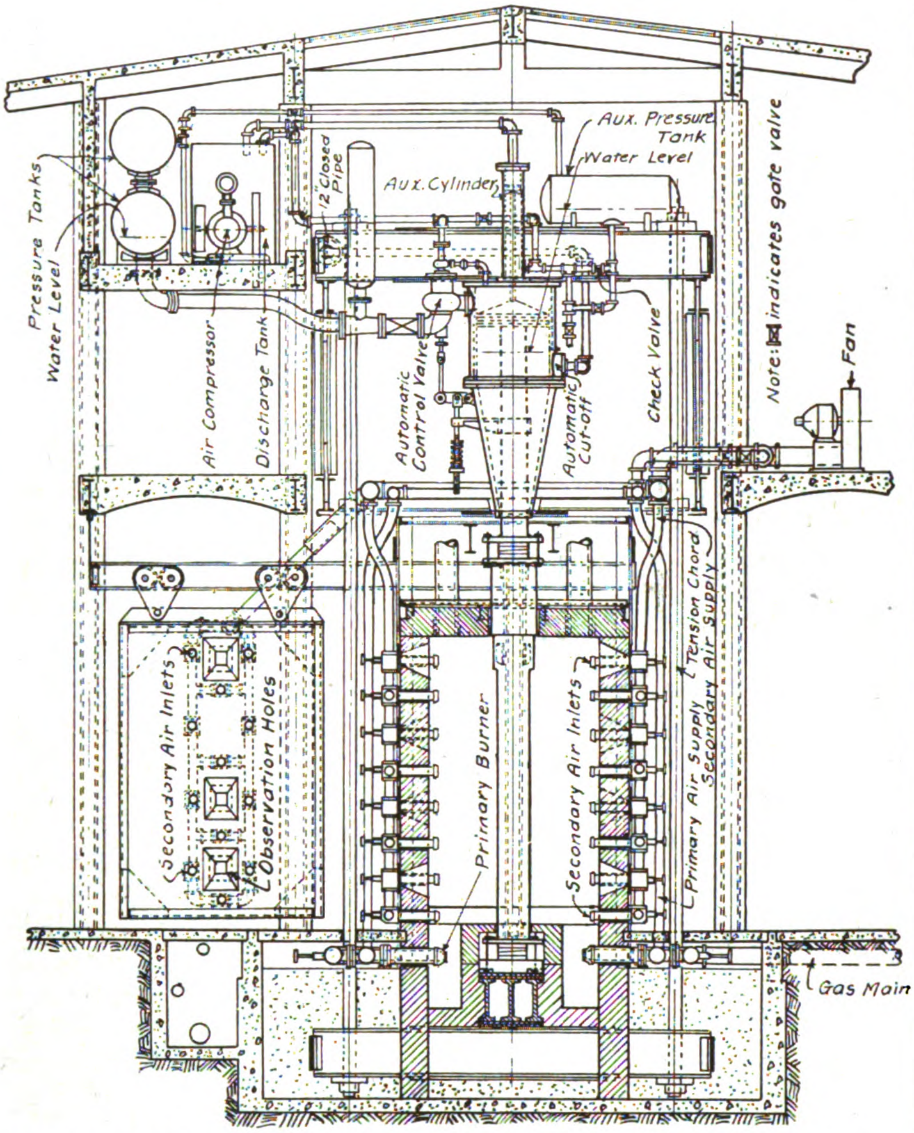
Loading Apparatus

"The apparatus to be employed in applying the loads to the columns during the fire and fire and water tests consists essentially of a hydro-pneumatic ram, the pumps and tanks supplying the pressure, restraining frames, and pressure indicating, controlling and recording apparatus.

"The ram has a rated capacity of approximately 256 tons and is bolted to the under side of the heavy steel beams forming the top of the restraining frame in such a manner that it will engage the top plate of the test column when in position. The column transfers the compression to the beams, constituting the bottom of the frame, which complete the action by transferring the stresses back to the top through steel tension chords forming the sides of the frame. The framing supporting the restraining frame at the top is also designed to aid in supporting laterally the lower end of the ram, and resist any racking set up by eccentricity of the loads when the test columns are deformed in the tests.

"The ram is designed to automatically maintain the load on the test column and develop characteristic deformation at the point of failure. In case of sudden complete failure the loss of the load is judged to be immaterial inasmuch as the load at which the column fails is known. In case of gradual failure, such as can be expected in the majority of cases, the ram is capable of maintaining the load until characteristic deformation of the column is secured. In case of sudden but incomplete failure of the test column, some loss in the load may take place, but this will be automatically recorded and is not considered important inasmuch as the full load throughout the complete period of deformation would probably only increase the rate of deformation, the characteristics of which have already been observed.

"The ram is connected by a 6-inch pipe to steel tanks in which the operating water and air pressures are stored, and is provided with a controlling valve that can be set to automatically shut off the pressure after any predetermined downward movement of the plunger less than 24 inches has taken place. It is also designed to absorb the impacts and withstand the pressures in case of the failure of the automatic controlling valve. A separate lifting cylinder and pressure tank by means of which the plunger of the ram can be independently raised and lowered is attached to the ram. Water and air pressure as high as 500 pounds to the square inch are supplied by an electrically-driven pump and compressor. The pumps and tanks are equipped with the necessary pressure gauges and the ram with pressure-recording apparatus. The connections are provided with the valves necessary for the manual control of the loading apparatus.



SECTIONAL ELEVATION OF TESTING MACHINE
Scale: $\frac{3}{16}$" = 1'-0"

"Adjustable bearings are provided at the top and bottom of the test columns to insure the central application of the loads.

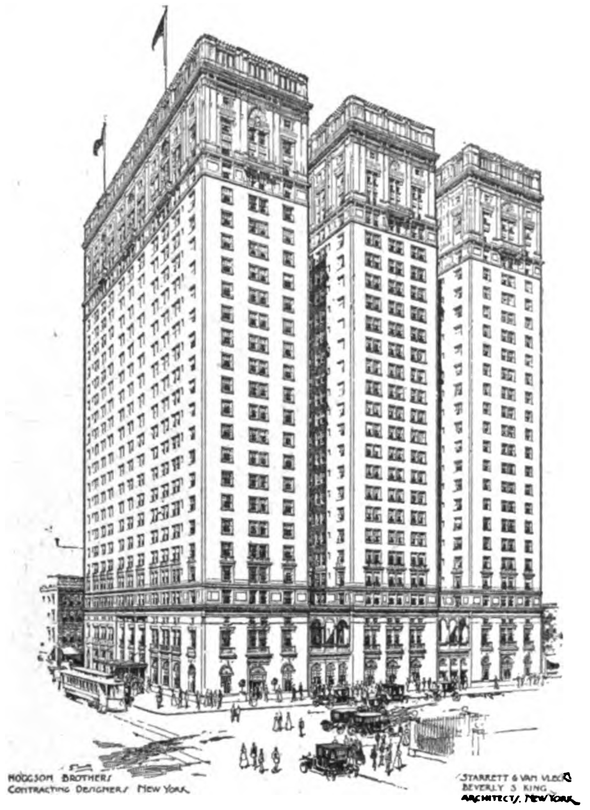
Apparatus for Testing Materials

"Standard apparatus is to be employed in the supplementary tests to ascertain the quality of the materials used in the construction of the columns and column protection.

Fire Stream Apparatus

"The apparatus used in subjecting the heated test columns to the action of fire streams consists of a special four-inch hydrant located on each side of and approximately 26 and 39 feet from the middle of the furnace, about 25 feet of 2½-inch hose, and a standard play pipe provided with a 1⅛-inch nozzle and a pressure gauge tapped into its base.

Largest Hotel *in the* World Planned *for* New York City



The Hotel Commonwealth, the largest hotel in the world. Designed under the Hoggson Building Method

A NEW $15,000,000 hotel is to be built in the heart of the Times Square district of New York. It is to be the largest hotel in the world, and in other respects one of the most remarkable. It will contain 2,500 rooms or more, cover an entire block front and be 28 stories high. It is to be called the Hotel Commonwealth.

Its exact locality has not been announced, but it will be near Broadway and Forty-second street, close to the convergence of two subways.

In general plan the building is to be in the form of an E above the mezzanine floors, so that the courts will afford the greatest possible amount of light and air for the guest rooms. The general design of the building is to be carried out in a refined Italian style; the lower stories to be of limestone above a polished granite pedestal course.

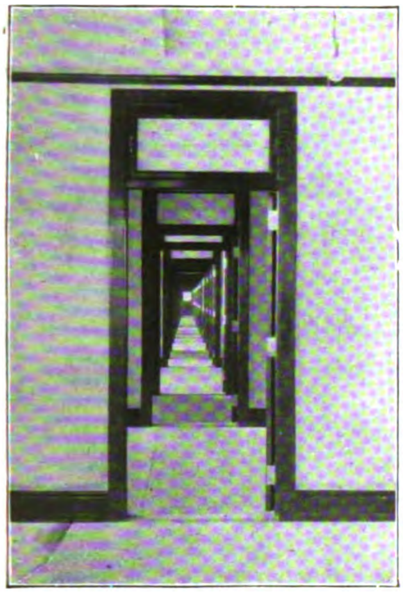
The main body of the building will be of a light grey, face brick, trimmed with limestone sills and terra cotta paneling. The upper stories will be trimmed with limestone and terra cotta, and the pergola parapet around the upper stories will be built of copper.

H. L. Merry, recognized as one of the greatest hotel managers in the United States, is to manage the Commonwealth. Mr. Merry has been retained by Hoggson Brothers, contracting designers, to assist in the planning of the building. The Commonwealth will be one of the very few hotels in the United States to have had the benefit of the advice of a practical hotel manager in its initial planning. Mr. Merry was, until he became associated with the Commonwealth Hotel Company, senior partner of the firm of Merry & Boomer, who managed the McAlpin and Claridge hotels in New York, and other hotels in Boston and elsewhere. The Commonwealth will be nearly twice as large as any existing hotel. Its rates will range from $1.50 a day upward.

Among the unique features of the hotel will be separate floors for bachelors and for women unattended, a well-equipped hospital for the care of the sick, a nursery for the children of guests, gymnasium, squash courts, indoor golf links, swimming pool, three different classes of restaurants, with prices to suit every pocketbook and a shopping bureau for the benefit of stockholders.

Most unique of all is the method of financing the enterprise. It is essentially a co-operative undertaking.

(*Continued on page* 173)



HOLLOW STEEL *in* BUILDING CONSTRUCTION

By William Wallace Ewing, C. E.

Member American Society for Testing Materials
Member American Society of Civil Engineers

THE development of the use of hollow steel in its various forms for building construction has been a direct result of a growing demand for doors, trim and window frames and sash, which would prove absolutely incombustible and, at the same time, afford the desirable qualities of *beauty* and *permanence.*

When the first large buildings using metal framework construction were erected, it was soon found that this metal framework was rendered useless by fire and the natural development was proper fireproofing of structural metal. This led to the construction of buildings in which the walls and floors were of incombustible material, and the structural metal framework was protected against fire; but still there was weakness. Such buildings, trimmed with wood and having doors and window frames and sash of wood, merely served as great furnaces for the destruction of contents. Such are the so-called "fireproof" buildings which permitted terrible catastrophes; so sudden is the spread of flames and so quickly are the means of escape cut off as the fire spreads from floor to floor in this kind of a building. This, then, was the great problem of safe building construction—to find a material which, having the æsthetic qualities of wood, offers no paths along which fire could travel; and which, in the form of fire-resistive doors, would serve as a check to the spread of flames to isolate the incipient fire and allow its extinguishment before serious damage was done.

The first development along this line was kalamein work, a manufacturing idea imported from Germany, and having as a basis the covering of wood members with a thin sheet of metal which could be painted and grained to imitate wood and was supposed to offer immunity from fire. So, too, the tin-clad door for use in fire walls of mercantile buildings was developed on the same principle, the only difference being that in mercantile buildings the fire hazard is more severe and the æsthetic quality negligible.

For some years, then, kalameined, or metal-covered wood, was used for interior doors and trim of office buildings, hotels, theaters—all buildings in fact, except mercantile and manufacturing buildings and those structures which were still built in the "fire-trap" manner using unprotected wood.

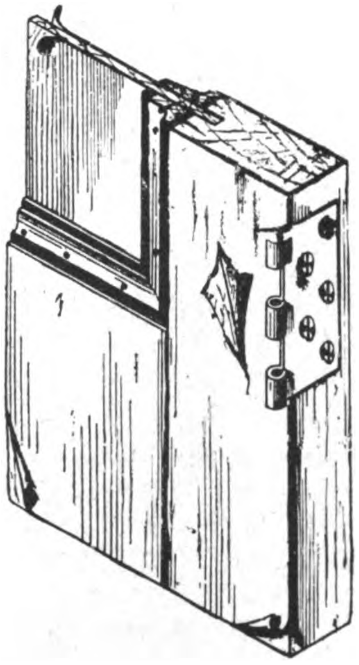
At this time also chemically treated or "fireproof" wood was used extensively in many large buildings, such as the Fuller Building and Times Building in New York city. This wood, which was usually treated with a solution of metallic borates, was found unsatisfactory owing to the fact that the chemicals contained made it impossible to obtain an attractive finish and, in addition, manufacturing costs were high.

Kalamein work proved unsatisfactory in several respects, although a great quantity is still used, owing to the many cheap varieties which are to be had. It is but natural that the average kalamein door should deteriorate. Dry rot of the wood core is almost certain to set in; and this core will swell and shrink with the atmospheric changes, causing the thin metal covering to buckle and rendering the work unsightly. The necessary finish of air-drying paint does not give the high-class effect necessary for the best construction.

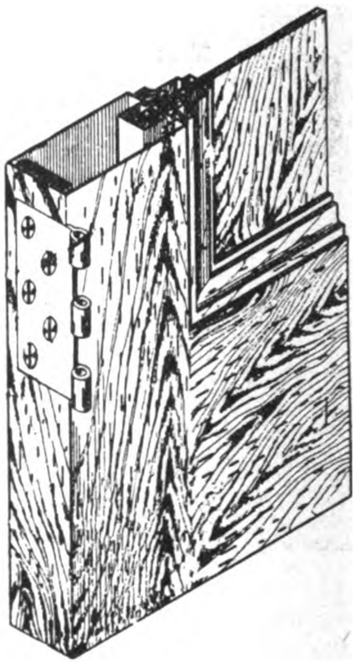
There are a few manufacturers, and they can be counted on the fingers of one hand, who make a door that is far better than the average kalamein work and approaches the standard of the hollow steel door. This door has a thin wood core and is steel-covered with a good finish.

In general, however, architects and prospective builders are warned against the use of kalamein doors and trim. At the end of a very few years these doors will have deteriorated seriously from both the fire pro-

THE ORDINARY KALAMEIN DOOR vs. HOLLOW METAL



KALAMEIN DOOR



HOLLOW METAL DOOR

A careful examination of these two types of door construction will show clearly the superior merits of hollow metal

tection and the æsthetic standpoint. This statement applies also to the use of tin-clad fire doors. These doors, even of standard construction, are at all times subject to severe weakening by deterioration. It is common in the inspection of manufacturing risks to find tin-clad doors in which the wood cores have rotted and the tin exterior rusted (even underneath the paint) to such an extent that one can kick a hole in the door with very little exertion. However, as this section of the article deals more with fire-resistive doors in other than manufacturing and mercantile buildings, the subject of proper protection of door openings in the latter buildings will be treated at length in a later instalment.

When the matter of the selection of doors and trim for a high-class building comes to the attention of the prospective builder the natural leaning, after a little investigation, is toward kalamein work; first, because it can be installed for less than half the cost of hollow metal; second, because the installation of hollow metal work at a higher price will bring no insurance reduction. This is an unfair condition and one which it is hoped will soon be remedied; but there are other considerations so much in favor of the use of hollow metal that the wise builder will pass over the matter of price for the purpose of obtaining quality. Thus it is that such buildings as the Widener Building, Philadelphia; the Singer and Equitable and Woolworth Buildings in New York city, and thousands of other buildings of the better type of construction throughout the country have been equipped with doors and trim of hollow metal.

The reason for selecting hollow metal in preference to kalamein at a lower cost have considerable weight. There is, for instance, the matter of *ultimate cost;* and more and more this matter of ultimate cost is wisely being taken into consideration in the construction of buildings. The ultimate cost of hollow metal is considerably lower than that of kalamein. The oldest installation of hollow steel in this country was as good as new after some eighteen years of service. Again the *cost of maintenance* is materially lessened when hollow steel is used. Painting is unnecessary at any time. The finish of such steel products consists of sevent coats of baked enamel, which will not deteriorate to make refinishing necessary. This finish may be grained to give the effect of wood or in plain color to form part of a general color scheme, and an *artistic and durable finish* may be obtained.

This article will be continued, its various installments treating the manufacture of hollow metal; metal window frame and sash; rolling steel shutters and doors, and doors for fire walls.

BUILDING LAWS AND ORDINANCES

Ban on Three Deckers at New Haven

While still permitting the erection of frame buildings outside the fire limits of New Haven, Conn., such structures in future must not exceed two stories in height, the city council having so decreed at a recent meeting. This action was aimed at the objectionable "three-deckers," the fire-breeding and insanitary qualities of which are now generally recognized.

The prohibitive ordinance above referred to reads: "Section 224. Outside the fire district before prescribed herein, buildings of frame or wood may be erected, but no frame building to be occupied or used as a stable, workshop or manufactory shall be built more than two stories or more than 25 feet in height, nor shall any wooden tower or spire on any such building be built or rebuilt to a greater height than 60 feet. No other frame or wooden buildings hereafter erected shall exceed two stories or 30 feet in height, except that dwellings occupied by not more than two families may have two and one-half stories, provided they do not exceed 30 feet in height or 3,000 square feet in area; that the attic in a two-and one-half story dwelling may be used for sleeping but not living rooms; but no family shall be domiciled above the second story in any such building, towers, turrets or minerts on any such buildings may exceed the foregoing limit ten feet, provided the horizontal dimensions thereof do not exceed 15 feet; church spires may be constructed of wood to a height not exceeding 75 feet from the ground, if placed not nearer any other building or structure than the equivalent of the height of said tower measured from its masonry support to the pinnacle."

Gardner, Mass, Would Limit Wooden Buildings

A measure before the Gardner, Mass., council would prohibit the erection of "any wooden structure within ten feet of any other building, without an intervening wall of brick." It is further intended to restrict wood tenement buildings to two and one-half stories in height. Buildings of larger size must be of brick or concrete.

Fire Alarm Signal Code

After several months of study, the Bureau of Industrial Code has completed its recommendations as to fire-alarm signal rules and regulations known as Bulletin No. 5. Hearings will be held in New York, Albany, Utica, Syracuse, Rochester and Buffalo on dates to be announced in the near future.

At present fire-alarm signal regulations apply to all buildings regardless of size or height. The proposed rules will create four classes: *first,* six stories in height or less; *second,* nine stories or less; *third,* twelve stories or less; *fourth,* all other classes of buildings.

Houston, Texas, to Have New Code

Nearly a year ago the council of Houston, Texas, passed an ordinance compelling firesafe construction in thirty-nine designated blocks in the central section of the city, a requirement since strictly enforced. At the same time, appreciating the obsolete character in many respects of the general building code then in force, the council placed the work of its revision in the hands of a special committee. The task is a severe one and will engage the attention of the committee for some time yet. E. E. Sands is city engineer of Houston and M. B. Leach building inspector.

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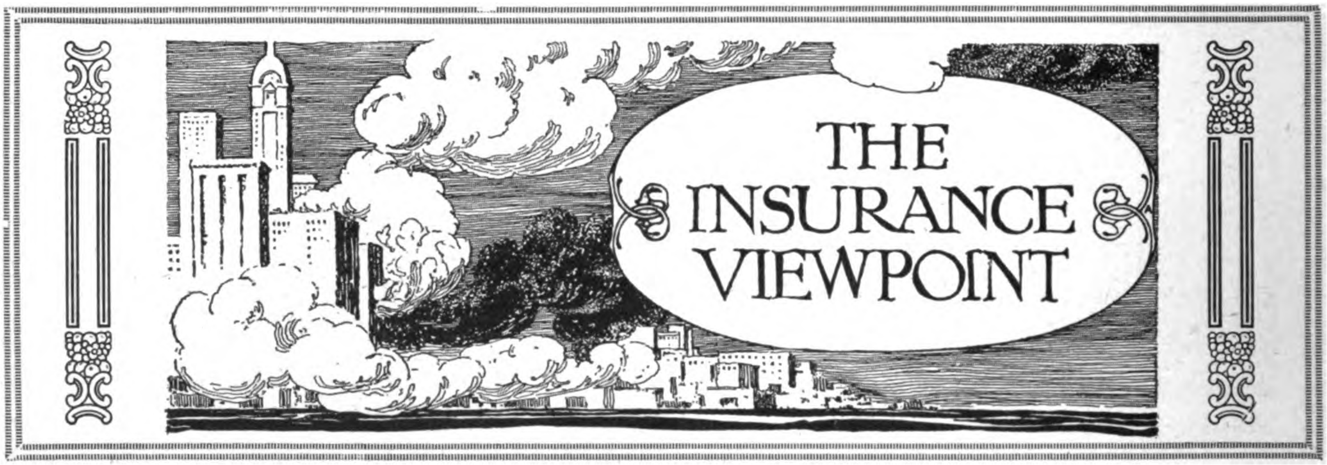


THE INSURANCE VIEWPOINT

Reduced Rates for Ohio

A new rate schedule for dwelling houses has been promulgated in Ohio. The basis rate for the class in Cincinnati, a city of the first class, is now 14 cents on buildings and 20 cents on contents, as against 20 cents and 35 cents respectively formerly charged.

The reduction is in keeping with the promise of the underwriters that such action would be taken immediately the fire record of the State justified. This latter result is due to the efficient work of the State Fire Marshal and the State Fire Prevention Association, two agencies that have worked systematically, intelligently and constantly in educating the general public toward better building practices and the safeguarding of properties against fire.

Local ordinances were adopted by many communities penalizing householders for permitting the accumulation of rubbish, and a sentiment created that regarded the preventable fire as a crime.

Satisfactory as the result of the fire prevention propaganda has been in Ohio thus far, it can be greatly improved and will be once the unwisdom of using wood in building construction, whether for dwellings or commercial properties, shall be more generally appreciated.

That it pays to safeguard against fire is again attested through the reduced insurance rates which the citizens of Ohio are now experiencing. Let the residents of other commonwealths take a hint from the Buckeye State and the country's annual fire loss, which in 1915 amounted to $182,836,200, will soon drop to modest proportions.

Spark Hazard an Expensive One

Easily the most prolific cause of fire in railway properties is the "flying spark," particularly in the neighborhood of shingle roofs, and railway engineers are studying constantly to reduce the hazard. From statistics compiled by the Railway Fire Protection Association it is shown that losses in 1914 directly traceable to the incendiary spark aggregated $486,964.95; the record for the preceding year was $412,212.95.

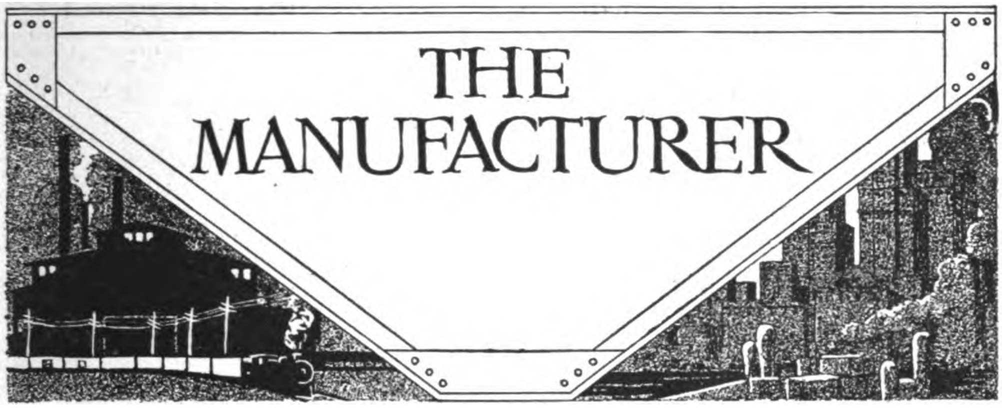
Inspection at Boonton, N. J.

A thorough inspection of the mercantile properties of Boonton, N. J., is being made by the Board of Fire Engineers of that city. All exits, stairways and airshafts in the different building will be noted on diagrams; these latter to be turned over to the firemen to serve in case of fire. While it is not stated that the investigators will recommend structural changes in the properties visited, where such changes seem to them advisable, the presumption is that they will do so.

Dallas, Texas, fire loss $87,094, with property value involved amounting to $1,023,751, the fire loss at Dallas, Texas, during January was $87,093.68. Defective wiring was responsible for six fires; defective flues, nine; while sixty-seven were due to miscellaneous causes.

Otto Roehm, chief engineer of Union Hill, N. J., recommends the installation of an up-to-date fire-alarm service for the community. Last year Union Hill's fire loss amounted to $95,368.

Nashville, Tenn., is moving intelligently in the preparation of its new building code, and the ordinace, when adopted, should go a long way toward improving the structural beauty as well as the fire safety of the buildings of that city. In preparing the code all proper interests are given an intelligent hearing, final judgment in the matter being left to architects and engineers of established repute. Nashville is to be commended upon the latest evidence of its progressiveness.



THE MANUFACTURER

¶ Co-operation is sounding a new note of progress across the vast fields of American industry.

¶ Here is a great undeveloped market for your product.

Results Justify Effort

IT matters not in what part of this broad country you make your residence you certainly must have heard of The First American Complete Building Show held in the city of Cleveland from February 16 to 26. Perhaps you were one of the ten thousand men of the trade who went from other cities to visit the Cleveland exposition.

This show—the first of its kind ever held in the United States and undoubtedly the most pretentious and complete material display ever staged in the world—taught many lessons.

One of the lessons that will have its effect upon business of manufacturing and selling fire-resistive building materials is the profit of such demonstrations. Some of the strongest factors in the fireproofing business have not done their share in the general promotion of the business of building safely.

They have suffered individually and collectively, and the whole cause of safe building has suffered because of their backwardness.

This criticism applies especially to clay products. The manufacturers of brick and construction tile that have engaged in aggressive publicity campaigns or in any way spent money intelligently to promote their business may be counted on the fingers of one hand

The Building Show taught them that it pays to advertise, for the entire exposition was advertising of the best kind—it was educational.

The Show was conceived and carried out by The Society Advocating Fire Elimination and did much to put this organization on the map in a national way. A great many people said, "If the S-A-F-E can do this it surely is a live organization and has unlimited possibilities."

The show should teach the lesson that the S-A-F-E is the one organization in the country intelligently promoting the interest of safe building and that it will profit every manufacturer and salesman of safe materials to be allied with it.

Lumbermen to Oppose Fire Prevention

The National Lumber Manufacturers' Association announces that it has completed the subscription of $50,000 for each of the following five years for the proposed trade extension programme. In addition to pushing the sale of lumber, an important feature of the campaign will be the antagonism of building codes and shingle roof ordinances and any other fire prevention activities which interfere with the use of lumber.—*The Bulletin.*

Largest Hotel in the World

(*Continued from page* 168)

One hundred and fifty thousand shares are to be sold to approximately one hundred and fifty thousand persons. Only the directors will be allowed to own more than one share. They are required by the laws of Delaware, under which the company is incorporated, to own three shares each. A board of thirty eminent bankers, merchants and manufacturers will manage the enterprise. Shareholders will be given a rebate on all their expenditures for food or lodging at the hotel. These rebates will be in addition to the dividends they receive.

Not the least unique part of the Hotel Commonwealth enterprise is the letting of a single contract to cover for a limited and guaranteed sum every detail of the cost of erecting and furnishing the building. This contract has been let to Hoggson Brothers, contracting designers, who will design the building, erect it, decorate it and furnish it at a figure which has already been determined. The firms of Starrett & Van Vleck and Beverly S. King & Shiras Campbell have been retained by Hoggson Brothers as the architects.

Recent Building Projects

The erection of a new high school to cost $125,000 is being considered at Greenfield, Mass.

Pittsfield, Mass., has decided to spend $7000 upon a new fire-alarm service.

A new county court house to cost $100,000 will be erected at Lubbock, Texas.

Business men of Middleburg, N. Y., are strongly urging the erection of a municipal building for the town.

A new $100,000 science building will be added to the equipment of Union College, Albany, N. Y., within a year if present plans carry.

At a cost of $20,000 the Ennis National Bank of Ennis, Texas, is to erect a new office building. It will be of brick construction and "absolutely fireproof."

One hundred and seventeen thousand dollars have been appropriated for building an addition to the Elmwood school at East Orange, N. J.

Plans are being prepared for a new building to be occupied by the Hickman Bank & Trust Company of Hickman, Ky. It is intended that the structure shall be one of the finest of its kind in the entire State.

To replace the building destroyed by fire on February 10 last, with a property loss of $48,000, the First National Bank of Marion, Ill., is erecting a new firesafe structure, which, it is figured, will cost $50,000.

In the erection of the new $200,000 high school building planned for Chicopee, Mass., care will be taken to avoid the features that made possible the burning of the former structure.

Thirty thousand dollars, it is figured, will be required to properly remodel the High School building at Mechanicsville, N. Y., along firesafe lines. A considerable element in the community favors the erection of an entirely new structure rather than recasting the existing building.

Of reinforced concrete and fireproof, the building of the Howe Rubber Company of New Brunswick, N. J., in process of erection when its smaller factory burned, will be so solidly constructed as to render it, in the opinion of the company's management, thoroughly immune from the fire hazard. The loss suffered through the burning of the old building was close to $50,000.

Pittsfield, Mass., is considering the demolition of one of its old-time school buildings and the erection of a modern 20-room structure in its place. The State Inspector not long ago condemned the present building as a "fire-trap."

Work is under way for the erection of a factory building for the Favis-Bournville Company, of Jersey City. Of brick construction and three stories in height, the new building, when completed, will represent a cost close to $50,000.

In the new building now being erected by the Immel Feed & Milling Company of Canal Dover, Ohio, to replace the property burned some weeks ago, the mill-construction type was adopted. The cause of the fire has not been determined.

Plans for a public school building to cost $105,000 were recently approved at Rochester, N. Y. Edwin S. Gordon of Gordon & Madden is the architect. The masonry contract was awarded Curran & Swarthout, local builders.

Alfred Hopkins of New York city is responsible for the plans upon which the new home of the Adirondack Trust Company of Saratoga Springs, N. Y., will be erected. The material to be used for the structure will be white marble, the completed building to cost $75,000.

A most attractive and substantial building recently completed is the home for nurses, attached to the Milford, Mass., Hospital. Designed by Bigelow & Wadsworth of Boston, the structure is of brick construction, steel-framed, granite-trimmed, and with reinforced concrete wherever particular strength is desired. Its cost was approximately $100,000.

To the General Fire Extinguisher Company of Providence, R. I., has been awarded the contract for installing an automatic sprinkler system in the Lincoln high school building, Jersey City. The cost of the equipment will be $4,500.

Within a short time it is expected work will begin upon the $100,000 parochial school at Troy, N. Y. Following the Gothic type of architecture, the structure will be four stories high, 80 feet deep and 120 feet wide. The front will be constructed of granite and pressed brick with Indiana limestone ornaments; ordinary brick, reinforced with concrete, being used for the remaining sections. All stairways will be of structural iron frames, with slate steps, while classroom floors are to be of reinforced concrete. It will be electrically lighted throughout and steam heated.

SAFE HOMES

A DEPARTMENT OF "CONSTRVCTION"

Devoted Exclusively to the Interest of the Home Builder

Edited by Ralph P. Stoddard

SURPRISINGLY quick and pleasing results from the First American Building Show, held last month, are being felt in Cleveland, where interest in firesafe construction has been given a distinct impetus. Inquiries by the score are coming into S-A-F-E headquarters and the improved ideas of prospective home builders are causing decisive changes to be made in numerous house plans in course of preparation for use this spring.

Building in general is certain to feel the stimulation of this keenly awakened interest. And that such an interest prevailed and made itself manifest was attested by every exhibitor of building materials farseeing enough to have availed himself of this exceptional opportunity to place his wares before the ultimate consumer. Many of them sold their exhibits completely and none failed to share handsomely in the business that came flowing to them from probably the most representative and really interested attendance ever commanded by any show in the city.

Particularly striking were the lumber exhibits. Fully alive to the growing spirit of the times, the lumbermen spared no expense and elaboration to make them especially attractive and to show to the best advantage the possibilities of lumber construction. And not one of them but carried away his proportionate share of the rewards of enterprise. It was by no means a one-sided exposition, either in exhibits or returns.

But when one remembers that Cleveland, located on the Lake shore and supplied from the forests of Michigan and Minnesota with lumber at a lower price than most of her rivals, has always leaned strongly to frame building, this sudden acceleration of interest in firesafe materials is peculiarly significant. It simply means, as was but lately predicted in this column, that the coming season's building will be featured more strongly than ever before by an increased use of firesafe and fire-resistant materials.

A really surprising development in the way of inquiry came from the Cleveland Chamber of Commerce, which had no connection whatever with the exposition, and which was in no wise a participant. But the Chamber is one of the city's ancient and honorable institutions. When one wants to know anything quickly and has no readier means of ascertaining it, he merely, from force of long habit and universal custom, calls up the Chamber of Commerce and makes known his immediate need. Rarely do the competent and courteous Chamber attachés fail to oblige.

Following the show, the Chamber was deluged with inquiries. This man had seen a metal lath, but had failed to take the name of the maker. This other one had seen a metal reinforcement for concrete work, or a fireproof floor covering, or a self-facing tile which bore no name, or some one of a score or more of firesafe materials, the use of which he had come to believe was essential to the perfection of his forthcoming home; and could the Chamber tell him where he could locate these various manufacturers?

Of course, the Chamber could not. But the Chamber had heard of S-A-F-E, knew something of its mission, its ambitions and its capabilities, and it directed the stream of inquiries into the proper channel. The result has been that S-A-F-E headquarters has been flooded with queries, with eager interested visitors, and an extensive list of fire-resistant material manufacturers who have yet to learn of and appreciate its efforts in their behalf will shortly be receiving numerous insistent letters. And Cleveland shortly will be furnishing them a growing market.

Throughout the show interest was keen in the prize house plans, particularly the $3,000 house plan, which provided a neat little cottage of six rooms, built entirely of fire-resistant materials. This cottage will feature scores of allotments in the city's environs this summer. And it will be duplicated in scores of other northern Ohio towns.

Excellent Designs of $3,000 Safe Homes

Designs Which Were Given Honorable Mention in the Complete Building Show Contest

The difficulty the jury experienced in picking the prize winners in the Complete Building Show architectural competition is evidenced by an inspection of those designs obtaining honorable mention.

These are of such exceptional merit that it required a rigid test on the part of the judges to eliminate them from those awarded prizes. In fact, it was the opinion of visiting architects that seldom has a jury had such an abundance of good material to pick from.

Owing to the high quality of the mention designs no order of merit was arranged by the judges. They grouped the drawings together, leaving the selection to those who may have occasion to study them with the idea of building from some one of them.

◆

The little cottage by S. C. Merrell and C. H. Dittmer, Cleveland, Ohio, has a number of excellent features. The good-sized reception hall and the combination stairway, a cold room off the kitchen and the many windows for light and ventilation make a commendable first-story arrangement. The second story contains two good-sized rooms with ample closets and a smaller one for use as a child's room.

This design lends itself well to the use of stucco on either lath or hollow tile, which the architects indicate as being their selection for exterior finish.

◆

Another interesting stucco house is that by H. Roy Kelley, Indianapolis, Ind. He also chose the cottage type and evolved a very livable little home. The exceptionally large living room with its big ingle-nook makes this a really homelike place for the family to gather. The porch will shelter quite a number. The upstairs arrangement is ample for the average family.

While the architect chose a stucco exterior, this little house would look well of brick, with a fire-resisting roof.

◆

The design of William Erwin Humphrey, Jr., of Washington, D. C., is one of the most original submitted in the competition. It has many points to commend it. Among these is the grouping of the rooms about the little entrance and stair hall. The living room is of good size and is well lighted by the windows grouped in and about the bay. The open fireplace in the dining room adds to this room's attractiveness.

Three excellent bed rooms are provided in the second story. All are well equipped with closets and ventilated from two sides. One might well be used as an upstairs sitting room.

Like its German prototype, this house employs tile covered with stucco as construction materials, with a roof of burned clay tiles in imitation of shingles.

◆

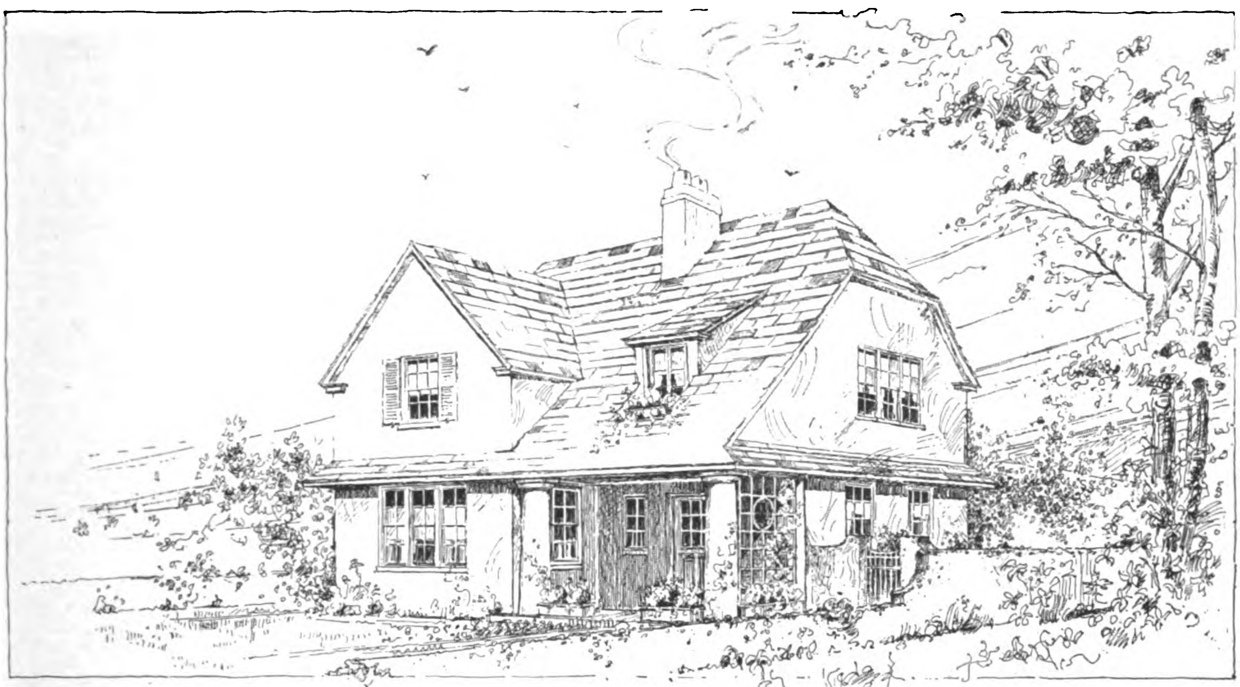
There is little lost space to be found in the cottage designed by J. C. Peterson, of Cleveland. He has broken his roofs in such a manner that there is no look of plainness, regardless of from what angle the house is viewed.

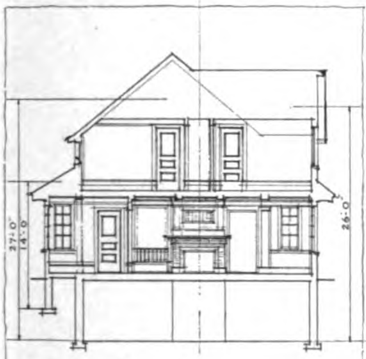
The downstairs rooms are well arranged and of good size. The recessed porch, which may be screened in summer and enclosed in glass during the winter months, adds greatly to the livable qualities of any home.

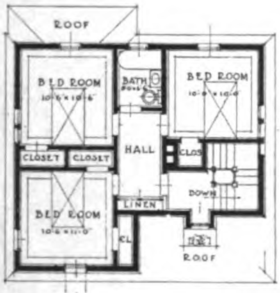
The chambers, while not large, are ample for average needs and are well supplied with closets.

Like many others, this architect chose safe materials for use in his design—stucco on hollow tile being utilized. With a roof of green or red tiles and the exposed brick decorations in harmony this would make a beautiful little home for any small family.

On the following pages will be found designs of $3,000 homes described above

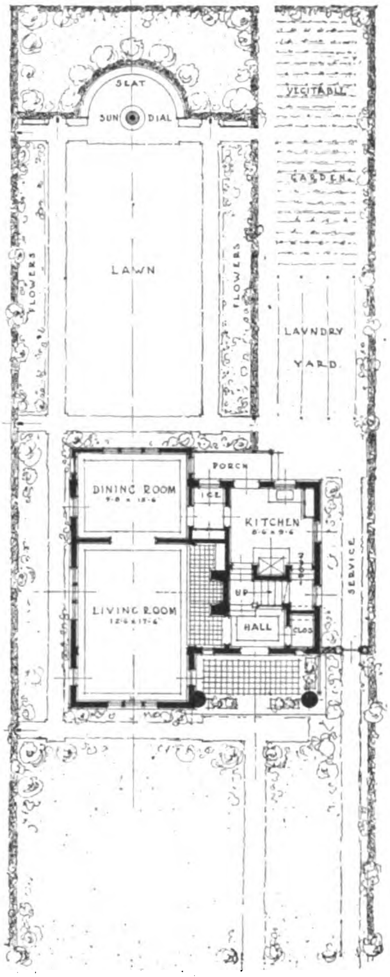


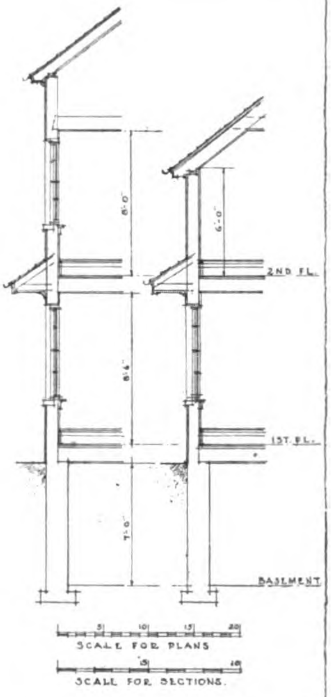




THE CUBAGE

MAIN-PORTION	19 x 27½ x 27 =	14,107½
FRONT WING	14 x 6 x 26 =	2,184
FRONT PORCH	14 x 6 x 16 x ¼ =	336
DIN. RM. BAY	14 x 4 x 14 =	784
REAR PORCH	3 x 8 x 6 x ¼ =	36
DORMER	1½ x 3½ x 7 =	33
PENT-EAVES	=	152
TOTAL IN CU. FT.		17,632½





DESIGN FOR A $3000 HOUSE

COMPETITION CONDUCTED BY
CLEVELAND CHAPTER
AMERICAN INSTITUTE
OF ARCHITECTS
SUBMITTED BY "HAL-REX"

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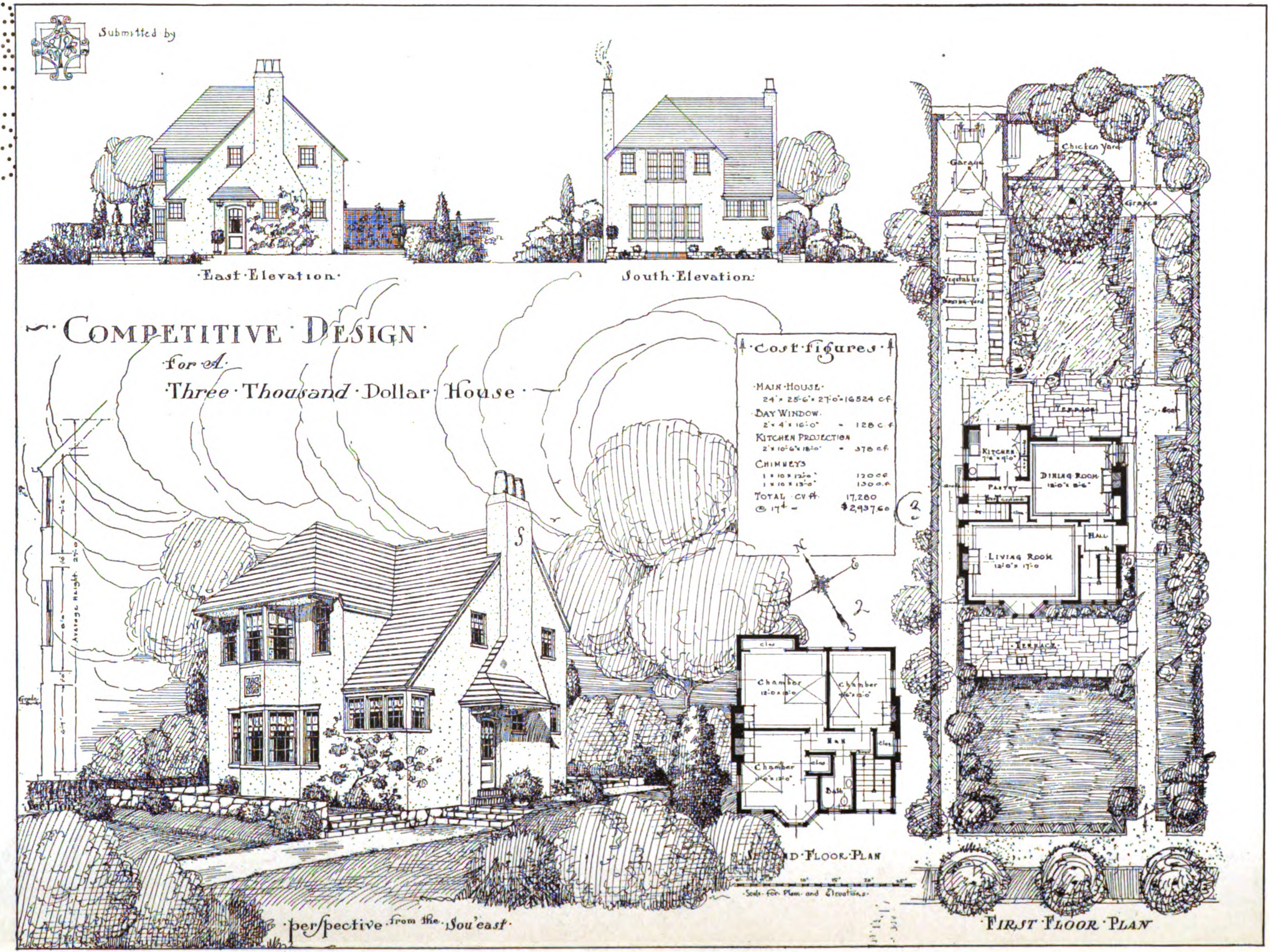

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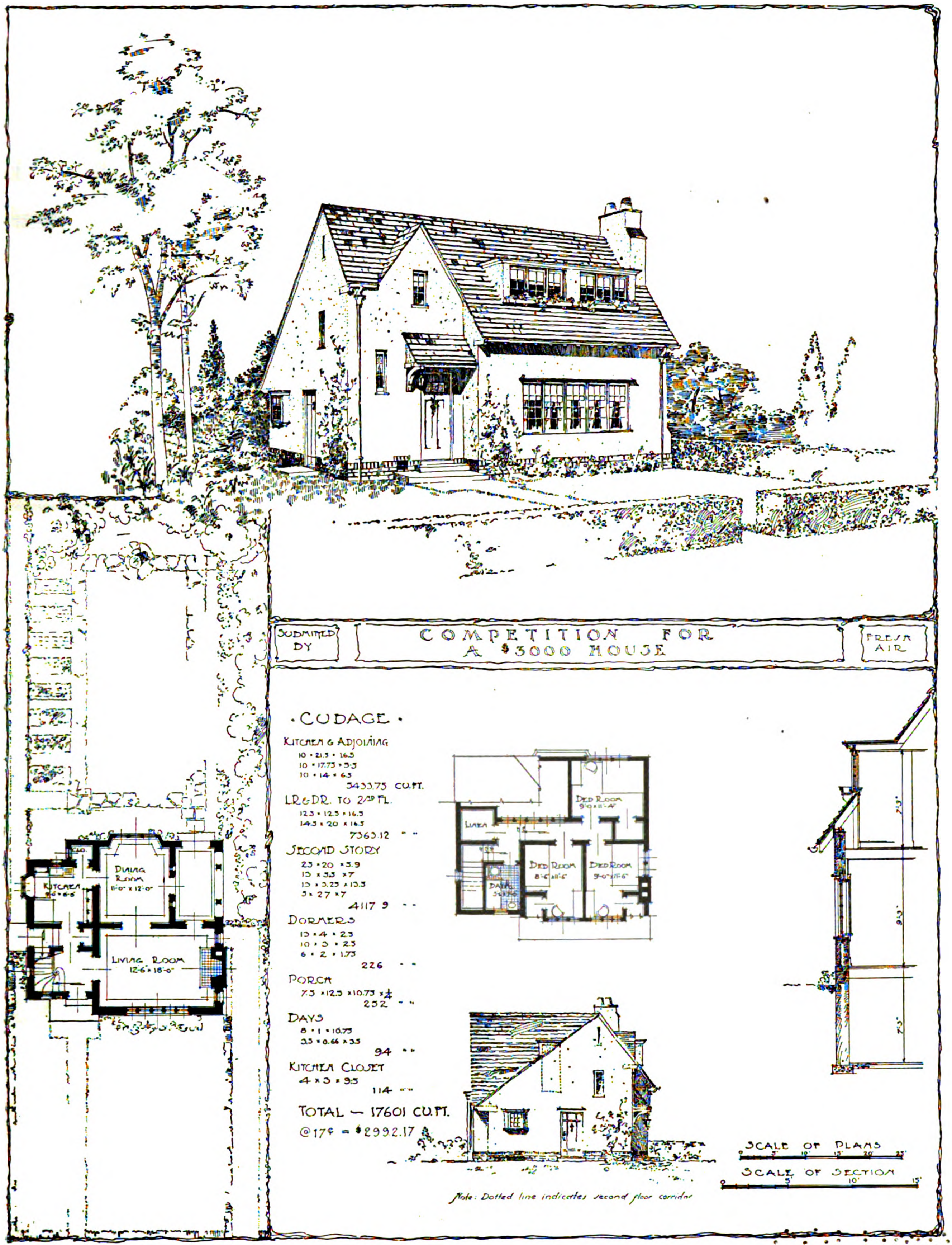

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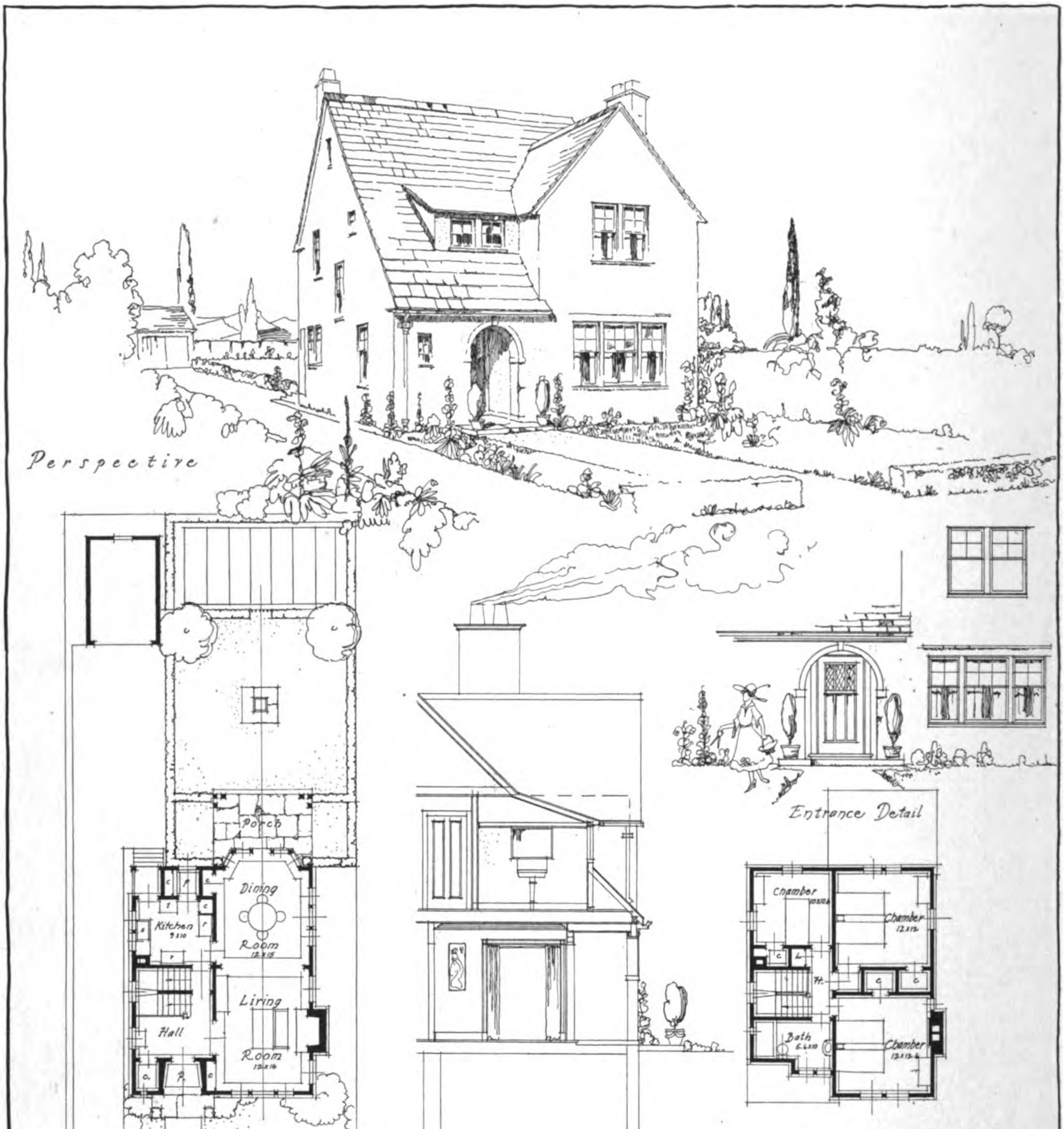

Scale of Plans 0 2 4 6 8 10 12
Scale of Section and Detail 0 1 2 3 4 5 6

Cubage

Main Portion	23½ x 23½ x 24¼ =	16,709 c.f.
Front Gable	13 x 4 x 10 =	520 "
Dining R. Porch	10 x 10 x (3+4) =	325 "
Total		17,554 "
		@ .17
Cost		$2984.18

A COMPETITION
for
A THREE THOUSAND DOLLAR HOUSE
IN CONNECTION WITH
THE COMPLETE BUILDING SHOW
SUBMITTED BY
A BOTTLE OF BLACK INK AND A BALL POINTED PEN

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WEATHER: Always warm in winter and cool in summer if you are in a firesafe home, office or factory building.

The Fireproofing News

LATEST EDITION

CONTAINING DETAILED DESCRIPTIONS OF NEW DEVICES AND APPLICATIONS OF MATERIALS WHICH ARE OF REAL VALUE IN FIRESAFE BUILDING: ALSO NOTES ON THE LATEST BOOKLETS, CATALOGS AND OTHER FIRESAFE LITERATURE, WITH OTHER ITEMS OF INTEREST TO THE FIREPROOFING FRATERNITY

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New York City, N. Y., March, 1916 **Priceless**

"BUSINESS IS BOOMING"

The Committee on Statistics and Standards of the Chamber of Commerce of the United States has submitted its report, which shows that the commercial prospects for the first quarter of this year are in marked contrast with conditions which' obtained during the same period of 1915. Excepting sections where conservatism still remains, due in a measure to the influence of high prices and the view that they will lessen consumer consumption, it is the feeling of the committee that a spirit of optimism exists the like of which has not been observed in almost ten years, and the results of which will pay the United States for all past misfortunes.

Mentioning conditions attributable to the European conflict, the report of the committee, whose chairman is A. W. Douglas, of St. Louis, reads:

"The adverse effect of the conflict in Europe still prevails in some sections, though to a very much less extent than at this time last year. There are still scattered fears of the possibility of this country being involved in the gigantic strife; but as against this the large portion of the people are paying less and less attention to the war and more and more are concentrating their thoughts and efforts on domestic matters. Beyond this is the striking fact that the influence of the war at present as a whole is more favorable than adverse, because of the tremendous impetus it has given to certain lines of manufacturing, especially east of the Alleghenies, and likewise to many agricultural products. This influence is a material factor in the present high prices of sheep, cattle, wool, grain, and of the products of leather, steel, iron, copper, brass, lead and zinc or spelter. Much of the prosperity in the grain-raising sections is due to the fact that the farmer is selling freely because of remunerative figures for his product, and there seems to be no manner of doubt but that these prices will decline materially in case of peace. While there are many conjectures as to the consequent effect upon business of such a contingency, the general belief centers around the conviction that the war will last for some time, and that the part of wisdom is to make the most of the present situation, regrettable as it is, and not take undue thought of the morrow by atempting to forecast the likelihood of what will happen if peace is declared, since there seems to be no stable analogies nor precedents in the past on which to base a sound opinion. The unfavorable effects on some industries have largely been overcome by time and the ingenuity of the manufacturers, but certain other lines of business still languish because of the continuance of the war."

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CEMENT SALES FOR 1915

Ernest F. Burchard, of the United States Geological Survey, in a report just released, estimates that the shipments of Portland cement for the past year total 86,524,500 barrels, as against 86,437,956 barrels for 1914, an increase of 0.1 per cent. This is for mill shipments. The production was about a decrease of 2.8 per cent below that of 1914. The supply of finished cement at the mills was in the neighborhood of 10.2 per cent less than that of 1914. The small decrease in production and the great decrease in stock reveal more caution. During prior years a marked tendency to over-production was evident.

Prices averaged a few cents lower per barrel in 1915 than those of the previous year, but at the end of the last season they advanced considerably. The amount of business was practically equivalent to 1914. The prospects for the current year are very good.

PROGRESSIVE ACTIVITIES OF CEMENT MAKERS FOR 1916

HIGHLY CONSTRUCTIVE PROGRAM ARRANGED

$700,000 Fund for Advertising and Publicity

"Printers' Ink," a New York publication which is an advertising authority, ran the following article in a recent issue, which shows what that clever magazine thinks of the advertising, publicity and business acumen of the Portland Cement Association:

Cement manufacturers will join in an extensive campaign of advertising that promises to be one of the largest co-operative movements of the sort ever started. A large fund has been provided for the cost of this advertising, as well as money for scientific research work, establishing consulting service, extensive publications on all phases of concrete work, school lectures, courses for cement workers, etc.

Manufacturers of Portland cement have been allied for a number of years as the Association of American Portland Cement Manufacturers, but last month at the annual meeting in New York even the name of the association was changed. It is now the Portland Cement Association—significant of the new trend, as it makes the *product* of the members the predominant feature of the association name.

About $700,000 will be raised by the association for the conduct of its work during the current year. This will be assessed against the manufacturer members according to their respective cement production.

An appropriation of upwards of a quarter million dollars has been approved for periodical advertising, and in addition there will be provided for direct distribution among prospective cement users a wide assortment of booklets and other publications. No syndicated editorial matter will be supplied, and press-agent methods of publicity will not be attempted. It is planned, however, to develop writers who will supply special articles of an informative nature on the subject of cement and its uses to farm papers and those covering other industrial fields, where such articles are desired.

The advertising in publications will appear in weekly and monthly magazines, technical publications and farm papers. Broadly speaking, the work of the association upon which special effort will be concentrated will relate to development along three lines: the use of concrete on the farm, concrete roads and concrete in building construction, *with special emphasis upon the fire-resisting properties of the material.* Certain uses of cement it will be possible to advertise in the broadest sense, while advertising of some particular use may be concentrated upon a rather prescribed area.

The present domestic demand for cement in the United States is only sufficient to take up seven months' maximum capacity each year, hence the need of advertising —more particularly that of an educational nature—which will increase the demand for the product in channels already established and develop new uses.

All members of the cement association have one material to sell, which is standardized and of comparative uniformity, and it is chiefly on this account that the association is in a peculiarly good position to undertake co-operative advertising. No one company has a sufficiently wide distribution to undertake national advertising, but collectively this may be done with economy, for the various producing plants are located all over the country.

Cement dealers will be encouraged to run local copy in newspapers simultaneously with the national advertising on the same subjects. It is quite important to have the local and national copy coincide. If dealers are induced to take an active interest in the advertising—and here again the association will be able to exert an influence that no individual manufacturer could wield—it is quite conceivable that more good may possibly result from the local than from the national advertising.

In setting forth the mass of argument in favor of advertising which is arrayed in his report, Mr. Beck, who is general manager of the association, laid emphasis on successful campaigns that have been conducted, not only by co-operative enterprises, but by building material manufacturers, whose fields are similar to that of the cement producers. Many of the campaigns cited have been described in detail in *Printers' Ink,* such as those of the Hydraulic Pressed Brick Company, Northwestern Expanded Metal Company and the Southern Cypress Manufacturers' Association. It was the preponderance of evidence and soundness of the arguments in favor of advertising that effectually silenced opposition among members. It is quite reasonable to suppose that all of the members did not go to the association meeting predisposed to assent to a campaign of co-operative advertising—indeed, many of them had previously contended that the association, as such, could not go into paid advertising.

Closely allied to the advertising activities of the association will be the work in other departments of the organization.

Technical research will form an important part of the association's work. It will be the aim to raise the standard of concrete and to strengthen the public confidence in it.

A staff of engineers will be placed in the field to co-operate with contractors, architects and public officials in their endeavors to obtain the best results—concrete work by the use of proper specifications and correct methods.

One example of the sort of laboratory work that will be undertaken will suffice to show what may be done in the way of technical research. An attempt will be made to design a satisfactory reinforced concrete railroad tie. A vast field for cement producers would be opened up if a satisfactory article of such wide use should be designed in concrete.

In the way of direct promotion there will be special bureaus to promote the construction of concrete work, to increase the use of concrete on the farm, to promote its use for fireproof construction, etc.

An educational bureau will assist in preparing courses for colleges and schools, will work through farmers' institutes and clubs, railway demonstration trains, inaugurate correspondence courses and the like.

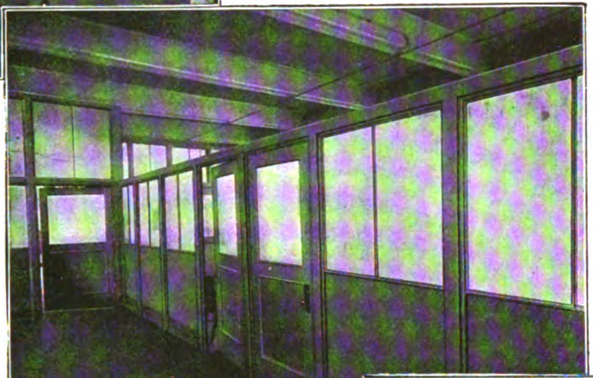
There will be a lecture bureau, from which speakers will be sent out to deliver addresses of both a popular and technical nature. Still other bureaus will circulate libraries devoted to concrete construction and co-operate with public libraries in similar effort; and co-operate with dealers, architects, engineers and contractors in promoting the use of concrete.

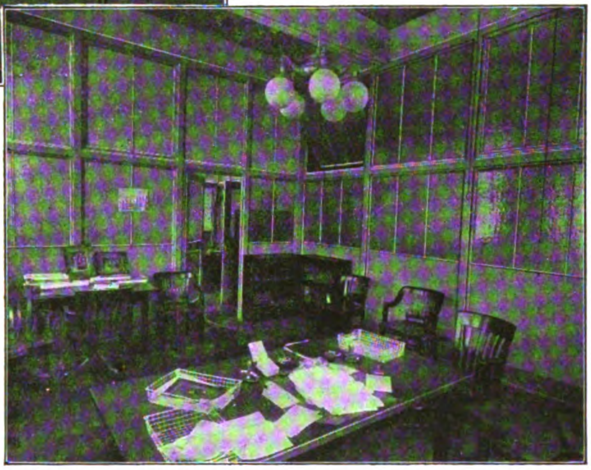
POMEROY HOLLOW METAL FIRE RETARDANT PARTITIONS

While it is generally admitted that modern science can make a building fireproof, the discouraging fact remains that the contents' hazard is always severe. The fire hazard continues to face property owners, architects and insurance authorities.

Next to the prevention of fires—which at present seems to be an impossibility—the most promising avenue toward the minimizing of fire risks seems to lie in the segregation of a fire within a limited space. The Pomeroy Hollow Metal Fire Retardant Partition is an outgrowth of this idea. Briefly stated, its function is to confine a fire, which may occur in the contents of a building, within a limited space defined by fire-retardant barriers which prevent the spread of fire to adjacent spaces similarly protected.

The Pomeroy Hollow Metal Partition is a logical extension of the fire retardant window business of the S. H. Pomeroy Company, Inc., with offices at 30 East Forty-second Street and factory at 282-96 East 134th Street, New York City. The Pomeroy Hollow Metal Fire Retardant Window—made in some twenty-seven standard types —protects the interior of a building against fire in an adjacent building or in an adjoining floor of the same building. It prevents the entrance or exit of flame through window openings. The Pomeroy Hollow Metal Fire Retardant Partition prevents the spread of fire throughout the interior of a floor by erecting non-burning barriers in its path.





These partitions are made in the Pomeroy factory by the same standardized methods and under the same interchangeable part system of construction that have contributed so largely to the superiority of Pomeroy Windows. They are manufactured, not built; which means that parts are made in quantities true to gauge and pattern by means of special machines and costly dies which assure absolute uniformity. These parts are then assembled by skilled workmen into completed units of unvarying quality and dimensional exactness.

The members are made of heavy gauge galvanized steel, pressed to shape without injury to the zinc coating. The bottom panels are of a similar material. The upper panels may be of steel or glass, as desired—the latter, of course, being preferred where interior division without impairment of lighting is sought. Obviously, for fire retardant purposes, wire glass must be used—either polished or in some of the figured patterns.

Pomeroy Partitions are furnished either standard 7-foot height or running clear to the ceiling. In the latter case, the upper members are of the same heavy steel, with panels of steel or glass as wanted. Where movable transoms are provided for ventilation, they may be fitted with automatic closing devices as a further fire safeguard.

The standard units can be quickly and inexpensively erected in a solid partition of extreme rigidity, the method of fastening the sections being such as to guard against any looseness or springing. Should rearrangement be desired at any time it can be accomplished at minimum expense by simply separating the units.

In the standard type of this partition the lines are extremely plain and dignified, with no ornamentation whatever. Ornamental moulding can be supplied, however, at small added expense. Each section is given a heavy priming coat of paint before erection. And the finished partition can be given any flat color or be grained to match interior trim and furniture. The method of manufacture minimizes production cost; and it is said that these partitions can be furnished erected at prices comparing favorably with those of the best wood partitions, which, however, lack the fireproofness and sanitariness and indestructibility of the Pomeroy Partition.

The illustrations herewith are from some photographs taken in the office building of Thomas A. Edison, Inc., at West Orange, N. J. In the erection of his new plant, following the great fire of over a year ago, Mr. Edison equipped his new office building with Pomeroy Windows and Pomeroy Partitions, as an added safeguard against fire loss.

While the most obvious field for a partition of the Pomeroy standard is perhaps in offices and office buildings, its merits must also recommend the Pomeroy Hollow Metal Partition for lofts, stores, factories, warehouses, schools and all other buildings where a flexible but fireproof means of interior subdivision is sought.

* * *

Andy never dropped a better hint than this: "Other men's brains have made me rich. 'Tis said I've more money than some. If so, 'tis because I've had more courage than some. I let the slow coaches use the old machine and the old methods—mine I chucked into the scrap heap, quick."
—Andrew Carnegie.

SHAKING HANDS WITH EVERYBODY

At Los Angeles, California, the lowest bid opened on February 17 by the Board of Education for erecting a *concrete, frame* and *brick* high school was submitted by the Los Angeles Planing Mill Company, 812 Industrial Street, at $434,931. John C. Austin is the architect, Baker - Detwiler Building.

HOUSE OF GLASS IS PLAN FOR FACTORY

Splitdorf Company's Annex, to Cost $200,000 Will Have 30,000 Square Feet of Windows —Will Cover Area 60 by 300

What will, it is said, be one of the best lighted factory buildings in this part of the country is about to be erected for the Splitdorf Electrical Company at Warren and High streets. It will be a fireproof building of reinforced concrete to cost approximately $200,000, and will contain more than 30,000 square feet of window glass about its four sides.

The structure is to be erected by the American Concrete-Steel Company, on plans prepared by Monks & Johnson, architects, of Boston, specialists in factory construction. It will have a frontage of 300 feet in High Street, extending from the company's present buildings to the bank of the Morris Canal, and will be 60 feet in depth.

While the building will be of concrete, its exterior will be relieved of plainness by a skillful use of colored tile and embossing work.

Practically the entire four sides of the building will be of glass, with the exception of the columns of concrete supporting the roof. There will be 180 windows on each of the long faces, these to have dimensions of 17 feet by 9 feet 4 inches. On each of the ends there will be eighteen windows of similar size.

To safeguard the building a sprinkler system is to be installed. It is understood that this is the first of several extensive improvements about to be made in the plant of the electrical company.

The structure will probably be ready for occupancy by July 1.

* * *

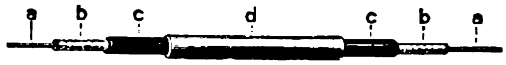
Arthur J. Baldwin, recently elected president of the Hill Publishing Company, is also secretary of the Mississippi Wire Glass Company.

* * *

Indifference never wrote great works, nor thought out striking inventions, nor rears the solemn architecture that awes the soul, nor breathed sublime music, nor painted glorious pictures, nor undertook heroic philanthropies; for all these grandeurs are born of *enthusiasm,* and are done *heartily.*

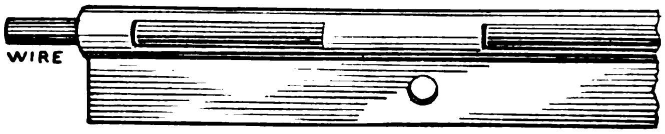
REAL FIRE DETECTION

No matter how carefully a home, school, hospital or any other type of building may be built, there is always a possibility of fire starting at some unexpected place at any time. How to locate the fire? There are many types of systems on the market. One is the Fire-Detecting Wire System—a thermostatic device—the entire length of the wire. (*See Fig. No.* 1.)



a—Copper core.
b—Fusible metal.
c—Insulation.
d—Outer metal sheathing.

This wire is installed in all parts of buildings, cellars, closets, under stairs and other out-of-the-way places. It is also protected where subjected to mechanical injury by a slotted patented metal molding. (*See Fig. No.* 2.)



The action of the wire: When the temperature of a room—either by a fire or excessive heat—reaches the temperature of the fusing point of the wire; i. e., 160°, 200°, 300° F., the fusing metal expands and forces its way through the insulation, thereby coming in contact with the outer metal sheathing; it closes the circuit on an open circuit or shunts the current on a closed circuit system; this in turn releases the relay, which sets in operation a fire gong or gongs, and if desired automatically lights an emergency lighting system (independent of the regular lighting system), so that in case of fire at any time these pilots will guide the way to the fire or danger spot. The wire will give a true notification within from 5 to 15 seconds, giving ample time to extinguish it with any ordinary extinguisher.

This system may be installed on any type of electric supply, such as batteries, dry or acid, electric light circuits, either alternating or direct, but when installed on a closed circuit system the failure of the current supply will give notice on a trouble bell. This type of system is so arranged that any unauthorized interference will also give notice of a trouble bell.

THE F. D. W. SYSTEM

1.—A battery plant is located at some designated point by either the engineer or architect, and generally consist of a locked sheet steel cabinet having a non-interfering device to prevent any unauthorized person from tampering with the contents.

This cabinet contains the batteries that may be required, which may be of various kinds and as desired; or, when permitted, on fixed resistance, direct from electric light or power plant.

From this cabinet the N. E. Code Standard rubber insulated wire is run in either flexible or rigid conduit to the inter-connection box or annunciator cabinet.

2.—The annunciator, indicator or registering cabinet is also generally located where directed by the engineer or architect.

This cabinet contains all the required relays, circuit breakers, automatic switches and other devices that may be required for any condition of construction that may exist, as this varies in residences, schools, hospitals, factories, hotels, office buildings, etc.

3.—From the instrument cabinet, wires are run in either flexible or rigid conduit to the connectors on various floors or rooms and to those connectors are fastened the fire-detecting wire, the run of which may be for any length to its terminal point of a room or floor.

4.—On a closed-circuit system the current consumption is exceedingly light, as all instruments and gongs are designed for the system.

5.—Red electric Pilot lamps to locate approximately the cause of alarm can be installed.

6.—Emergency lamps can also be used where it is desired to have light independent of any outside source, and may be used in case of failure of central station power, depending upon the maximum limit of the battery power.

7.—The system as installed may be termed a self-supervising system, as any unauthorized tampering, injury or trouble of any kind, depression or failure of battery plant will give due notice by the ringing of the trouble bell, which will operate until attended to.

Where it is not desired to use the continuous form of fire-detecting wire, the thermostat (*Fig. No.* 3) is used. This thermostat is made of short pieces of fire-detecting wire, and will protect an area of 100 square feet.

This wire or thermostat will operate within from 38 to 58 seconds faster than a sprinkler head, and, like the sprinkler head, will not give a false alarm unless by severe injury.

These systems have the approval of the Bureau of Fire Prevention and the Bureau of Standards of the New York Fire Department:

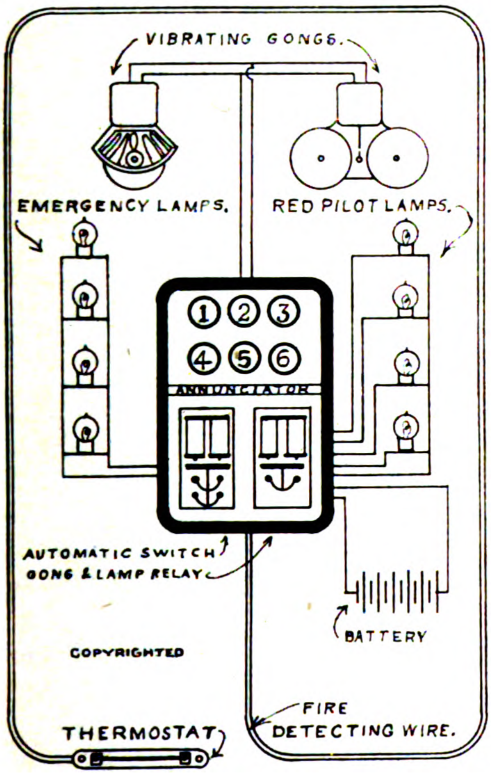
Safety - First Federation of America.

Department of Commerce—Steamboat Inspection Service.

National Board of Fire Underwriters.

It has been installed in many residences in New York and vicinity—apartment houses, aboard steamships, and used by the U. S. Navy.

The entire system may be seen in actual demonstration at the office of The Fire Detecting Wire Company, Inc., 101 Park Avenue.



Announcement is made that the Barrett Manufacturing Company and the American Coal Products Company have decided to unite the good will and high reputation of both concerns under the name of The Barrett Company.

$500,000,000 LOST!

Every year the American people waste enough money by fire to build the Panama Canal; enough to build a navy equal to what we now have. This loss comes out of the pockets of the American people, and is the tribute they pay to carelessness and ignorance.

Three thousand lives and $250,000,000 of property is the annual sacrifice which this Nation offers on the altar of carelessness, recklessness and lack of preparedness. Two hundred and fifty million dollars more each year is expended in maintaining fire departments and in fire insurance premiums, so, altogether, we have the staggering sum of $500,000,000 as the Nation's annual fire tax!

No man can escape the burden of this tax. No matter what your business, no matter whether you own property or rent from others, you cannot escape your share of this annual burden. From the time cotton is ginned and baled, during its shipment, throughout the storage period, while being manufactured into cloth, on the shelves of the retailer, and finally in your own home as linen, it is compelled to pay tribute to the relentless tax tyrant.

Consider for a moment what we might do with $500,000,000. We might build a Panama Canal every year. We might equip our Army and Navy in a way which would please the most enthusiastic militarist. Five hundred million dollars would give us good roads from the Canadian line to the Gulf of Mexico, and from the Atlantic to the Pacific—better roads than could be found anywhere else.

We Americans are prone to boast of our intelligence, initiative and progressivism—and rightly so. We have done much and gone far, but the most superficial analysis shows that a very large measure of our prosperity and success may be attributed to our wonderful natural resources.

Conservation has only recently become a popular slogan in this country. CONSERVATION and EFFICIENCY—two big movements that go hand in hand. But in this matter of fire prevention our lack of efficiency and our puny attempts at conservation suffer much when compared with the records abroad. Our annual fire waste is FIVE TIMES AS GREAT as that of any nation of Europe, omitting, of course, conflagrations due to the present conflict. No other modern nation would tolerate such gigantic carelessness.

HYDRATE LIME IN CONCRETE

So widely has the use of hydrate lime in cement concrete been exploited that the United States Bureau of Standards lately advocated a conference in order to receive the views of engineers and chemists interested in Portland cement and this material. A meeting of this character was held at Pittsburgh, about twenty outside the city attending, amongst whom were engineers and chemists who are more or less neutral on the subject. The use of hydrate lime in concrete was discussed. An investigation was outlined to consider every phase of the matter.

SUCCEEDS DARWIN R. JAMES

C. Louis Allen Elected President of Pyrene Company

C. Louis Allen, 32 years old, has been elected to the office of president of the Pyrene Manufacturing Company. He succeeds Darwin R. James as president of the company, who was elected to the presidency of the American Chicle Company, and to which he is going to devote a large part of his time.

Mr. Allen became connected with the Pyrene Company on April 1, 1914, as a salesman. Six months later he was advanced to the position of sales manager, and on June 1, 1915, he took charge of the advertising department, as well as retaining the position of sales manager. He is a graduate of Washington College, of Washington, and during his business career has been connected with the Federal Government, which he left to assume the duties of a salesman.

* * *

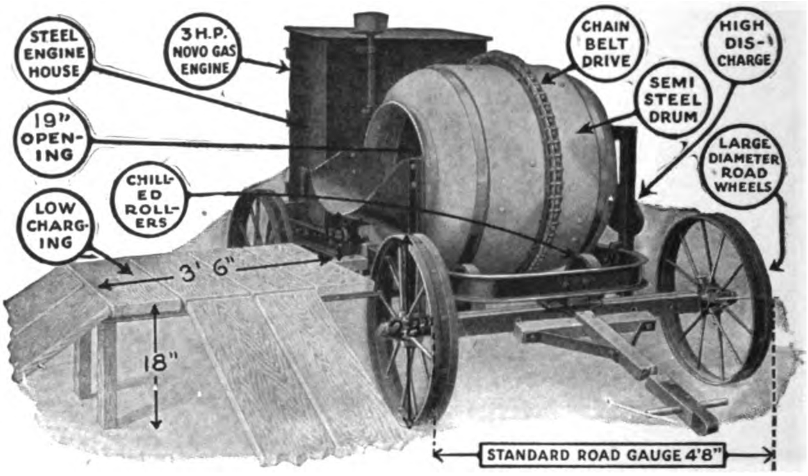
Arthur S. Meloy, architect, Bridgeport, Conn., is the author of a very complete book entitled "Theaters and Picture Houses," brought out to meet the demand for greater knowledge regarding theaters and motion-picture house construction, due to the fact that more structures of this type are being erected now than at any other time. Mr. Meloy's book is the first that has been published in twenty years on the subject with which it treats. The volume is from the press of the Federal Printing Company, and may be obtained from the publishers, the Architects' Supply & Publishing Company, Tribune Building, New York City. Price, $3.00.

* * *

A man in old age is like a sword in a shop window. Men that look upon the perfect blade do not imagine the process by which it was completed; for man is a sword; daily life is the workshop; and God is the artificer; and those cares which beat upon the anvil and file the edge, and eat in, acid-like, the inscription upon the hilt—why, those are the very things which fashion the man.—*Beecher.*

REX LOW CHARGING MIXER

Rex Bulletin No. 62, just received from the Chain Belt Company of Milwaukee, amply illustrates and thoroughly describes in detail the construction, adaptability and operation of their Rex Low Charging Mixer, which offers the contractor an opportunity to obtain at a reasonable price a high quality, low-charging machine. The Rex was designed for the contractor who builds sidewalks, curbs, gutters, silos, culverts, basements, floors and other work where the use of a higher priced machine would not be justified. The Chain Belt Company manufactures every part of the mixer with the exception of the gasoline engine, and the mention that this latter part is supplied by the Novo Engine Company affords ample guarantee that the Rex Mixer will occasion no power troubles. The Chain Belt people own and operate their own malleable iron, grey iron and steel foundries, as well as machine and structural shops, and has been manufacturing machinery continuously for a quarter of a century and concrete mixers for eight years. Their contractors' machinery is seen on many of the most important jobs all over the country. In addition to the Rex Mixers, they make a complete line of Standard Chain Belt Mixers and Pavers, ranging in capacity from 3½ cubic feet to 1 cubic yard of mixed concrete. Upon application they will gladly furnish interested concerns with special literature covering their entire line.



Capacity—The Rex 6 has a capacity of 6 cubic feet of loose materials or 4 cubic feet of mixed concrete per batch.

The Rex 10 has a capacity of 10 cubic feet of loose materials or 7 cubic feet of mixed concrete per batch.

The Rex Mixer will thoroughly mix and discharge a batch of concrete in about 45 seconds.

Charging apparatus—The charging platform is extremely low, being 18 inches above the ground on the Rex 6, and 22 inches above the ground on the Rex 10. A steel ledge is placed on both edges of the platform for supporting the plank runways. It is only necessary to run the wheelbarrow up a very easy incline in order to charge the mixer. The charging opening in the mixer drum is 21 inches in diameter and all material enters the drum at once from the wheelbarrow without spilling. The platform is furnished, but not the runways. The platform can be quickly detached and placed onto the machine when moving the mixer.

The contractor can buy the Rex 10 with a low-charging platform at first, and later, if he desires, can equip this machine with a power loader. This can be done with very little trouble.

Discharging — The discharge chute is of the pivoted type. The lower end of the discharge chute is high enough above the ground to discharge the mixed concrete into the wheelbarrows without any delay or unnecessary slopping.

Construction—All materials entering into the construction of the

Rex Mixer are steel or refined semi-steel, the only timber parts being the tongue and the charging platform.

Drum—The drum is of cast semi-steel made in two sections bolted together in the middle. It is exceptionally hard, tough and durable. The walls have no rivets to work loose. The sprocket teeth are cast in sections, which are bolted to the drum. They are amply strong to withstand any strain they may receive in operation, but, if through some accident a tooth should be broken, it can be replaced in a few minutes' time at a very small cost. The mixing blades carry the material in a very rapid manner from the large charging opening toward the center of the drum, where it is carried upward by discharging buckets and drawn back again into the mixing blades. The drum is supported on large rollers, which are lubricated by means of compression grease cups. The faces of the rollers are chilled like car wheels and cannot wear flat or oval, which insures a true running mixer drum.

Drives—The Rex Mixer is driven by Griplock Riveted Chain Belt and Chabelco Steel Chain Belt.

Frame—The frame is constructed of heavy steel channels and thoronghly braced, thereby allowing no opportunity for the machine to get out of alignment. A wagon or hand tongue can be furnished with the mixer.

Power Equipment—The Rex Mixer No. 6 is furnished with a Novo, 3-horsepower gasoline engine. For the No. 10, steam or electric power can also be furnished. The Novo engine is a reliable outdoor engine, simple in construction and particularly adapted for use on contractors' machinery. It is a vertical hopper type, water-cooled, 4-cycle engine and is entirely enclosed in a steel housing. The engine is frostproof and cannot be damaged by the water freezing, which permits uninterrupted operation under the most severe climatic conditions. It is light in weight and has no complicated or delicate parts to cause annoyance to inexperienced operators. The fuel supply is carried in the base of the engine and is sufficient for a day's run. The steel housing is amply large and offers ample room for the battery as well as all necessary tools, oil cans, etc.

Clutch—The countershaft which the engine drives is equipped with a friction clutch, so that the engine can be started without turning the mixer drum.

Wheels—The Chain Belt Company has considered very carefully the fact that a machine of this type will be hauled over all kinds of roads and has therefore equipped the Rex Mixer with large diameter road wheels and made the gauge of the road wheels the standard wagon gauge. The wheels are 28 inches in diameter.

Testing—Every machine is thoroughly tested under its own power and is rigidly inspected before leaving the plant.

Guarantee—The Rex Mixer is guaranteed for a period of one year against inherent defects in workmanship and material and any parts that are defective will be replaced F. O. B. Milwaukee. This guarantee does not include the Novo Gasoline Engine, but this has the same guarantee placed upon it by the Novo Engine Co., Lansing, Mich.

SIZES AND CAPACITIES OF REX MIXERS

Number of Mixer	6	10
Capacity per batch in cubic feet—		
Unmixed sand, stone and cement	6	10
Mixed Concrete	4	7
Horse-Power Furnished—		
Steam Engine	—	5
Steam Boiler	—	6
Gasoline Engine	3	6
Electric Motor	—	5

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"The master minds back of every great business operation have made economy a science. Men of such size are never misled by that beguiling deceiver who always ensnares the mediocre—'first costs!' They are far more concerned about the cost of maintenance, durability, and efficiency; they make a searching analysis to determine the *final* cost, because they know this *ultimate cost* is in all cases the *real* figure with which they will have to reckon."—*J. B. Haines.*

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"Ignorance," says Ajax, "is a painless evil." So, I should think, is dirt, considering the merry faces that go along with it.

NEW THOUGHTS ON CONCRETE FLOORING

In a recent number of *Sunset Magazine,* Irving J. Gill, of San Diego, an architect of national reputation for original design in concrete, brings out some new ideas on the concrete floor.

Most people are adverse to concrete for floor purposes, because they are slaves to habit and because concrete floors are not what they ought to be. After reviewing the history of all sorts of flooring and some of their drawbacks, Mr. Gill claims that most concrete floors have not developed beyond the sidewalk stage; that if proper thought, time and money were expended in developing the excellences of the concrete floor most people would want it for their residences; that it is the business of the architect to overcome prejudice against this material for use in homes; that certain definite fundamental conditions are to be exercised in laying concrete floors; that in their strict observance lies the answer to every charge of physical discomfort — coldness, dampness, etc.; these objections overcome, attention may be given esthetic considerations.

Concrete floors are usually laid free from the ground, with a dead air space underneath. In most of my houses the concrete floors are laid directly on the ground, doing away with air circulation under the floor and giving a more equable temperature. They are raised at least twenty-one inches above the surrounding ground, and particular attention paid to the preparation of the earth bed. After the foundation is laid the ground is puddled and tamped until very firm. Over the surface is spread from four to six inches of sand or sandy loam. Then the concrete is put on. If one part of the floor is below grade the ground under it is carefully drained, after which the layer of sand prevents moisture from coming through.

The main body of rough concrete should be reinforced to one-third of 1 per cent to prevent cracking, and scored to give a key to the top coat and prevent its loosening from the bottom. The finish coat should be reinforced with number eighteen gauge half-inch mesh galvanized wire to prevent cracking.

From four to six weeks should be allowed for cement floors to dry. During this time there is a continuous process of absorption and radiation of heat until a mean temperature has been reached, after which the temperature of the floor is more equable than that of wood.

To cover a cement floor with wood is about as logical as to cover cement sidewalks with boards. Everybody who has lived on cement floors laid according to the given specifications has been wholly converted to them, and would never again be bothered with the care and trials of wood floors. It is not, of course, expected that concrete floors should be left bare. They should be partly covered with rugs, the same as a polished wood floor. Incidentally, when properly laid, waxed and polished, cement floors are ideal for dancing.

When troweled and finished to a gloss, cement floors do not mar or scratch. They should not be scored or marked off into squares or designs; the natural crazing of the top coat is far more pleasing. I mix color with the cement, usually tones of red and yellow, red and brown or yellow and brown slightly mottled. Tempered by the gray of the cement these colors produce neutral tones that are a splendid background for rugs and furniture. When quite dry, the cement should be cleaned with a weak solution of ammonia and water, given two coats of Chinese nut oil to bring out the color, then finished with a filler and waxed like hardwood. Well done, this treatment gives an effect of old Spanish leather.

It is quite as impossible to tell how to lay and finish a cement floor to bring out all its potential beauty as it is to give exact rules for the painting of a picture. Specifications and instructions carry one just so far, but beyond that point each builder must study out the problem for himself. It takes the knack or the inspiration or the gift —whatever its name—that differentiates craftmanship from mere mechanical perfection, that raises the artist above the artisan, to make a cement floor the thing of beauty it can and should be.

Before it has set, cement is a wonderfully plastic material, more wonderful than clay. It can be colored, modeled, shaded, surfaced, and then of itself hardens into an everlasting expression of the workman.

The protest against ordinary cement floors is the unconscious demand for the thing well done. Cement floors will never come into their own until architect and workman study them as an art.

Concrete floors are cheaper than wood for the first story, they are enduring, they require a minimum of care, they are comfortable and healthful when laid right, they are very beautiful, and they are, of course, firesafe.

* * *

The Walter Concrete Machinery Company of Indianapolis, Ind., has issued a substantial 40-page booklet descriptive of their machinery for making Walter Concretile Roofing. The booklet is plentifully illustrated with clear pictures of the machine and the various forms it produces, with nearly thirty photographs of different dwellings and detail plates showing the adaptability of Concretile to every requirement of proper roofing. The text matter deals with the machine and its proper use, the application of its product, the question of costs, details of a test conducted by the Laboratory of Applied Mechanics, University of Illinois, and concludes with a number of letters received from architects, owners, contractors, dealers, engineers and others who give their indorsement of Concretile.

* * *

"Luck" is a jim-dandy word—if you put a P before it.

* * *

America is a fortunate country; she grows by the follies of our European nations.—*Napoleon,* in 1816.

* * *

The highest purpose of intellectual cultivation is, to give a man a perfect knowledge and mastery of his own inner self.—*Novalis.*

* * *

An advertisement without a reason is most likely to be one without profit.

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The first American Complete Building Show, which closed with such pronounced success at the Coliseum, Cleveland, February 26, represented nearly a million dollars invested in two hundred exhibits by over six hundred firms! This signal success proves the value of cooperation and sets up a strong example for other large cities to pattern by.

* * *

The passing of the shingle roof
To some will bring great joy;
It wouldn't do to use a
Claytile shingle on your boy!

* * *

The most famous Greek sphinx was that of Thebes, whose habit was to propose a riddle to all passers, and upon their failure to guess it to destroy them. The Thebans offered the hand of Jocasta to the man who would rid them of the monster. Œdipus, son of Laius and father of Eteocles, Polynixes, Antigone, and Ismene guessed the answer to the riddle; the Sphinx slew herself, and he thus became king. The riddle is said to have been: What business, service or product cannot be advertised to advantage? The answer is: None! And since the construction of the Great Sphinx at Gezeh, which was built of firesafe materials during the reign of Chephren of the fourth dynasty, no man has been able to disprove the truth of this answer

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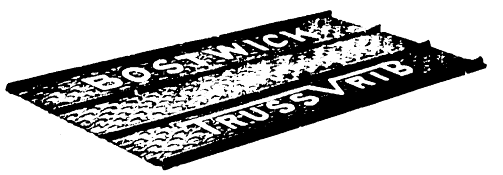

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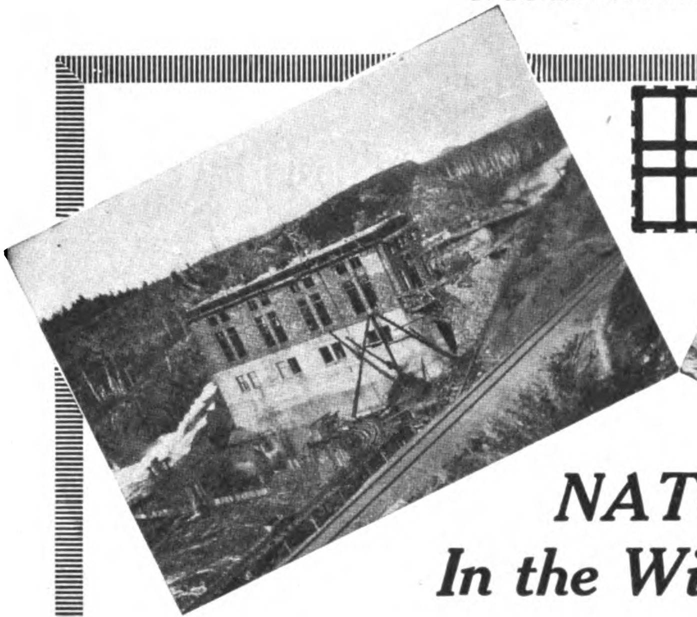

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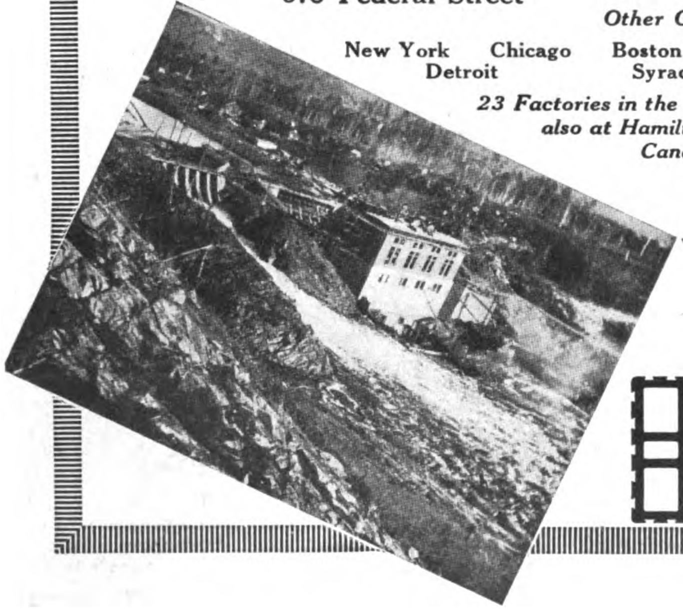

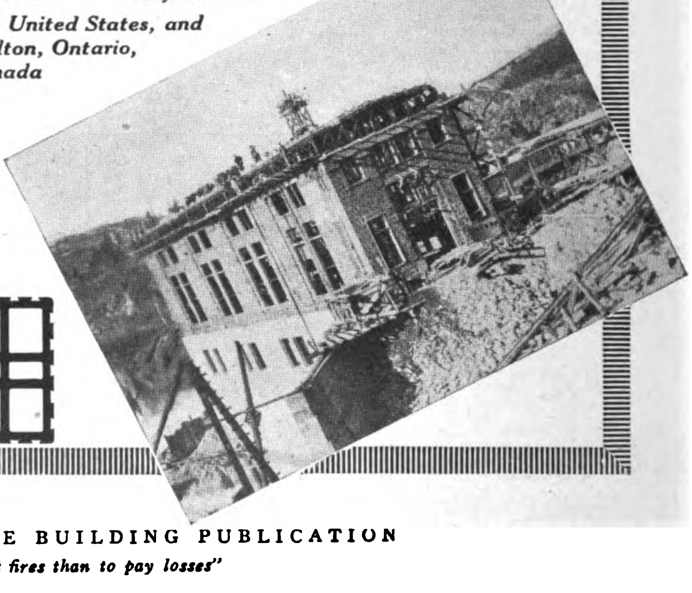

OFFICIAL JOURNAL OF SOCIETY ADVOCATING FIRE ELIMINATION

CONSTRVCTION

WITH A
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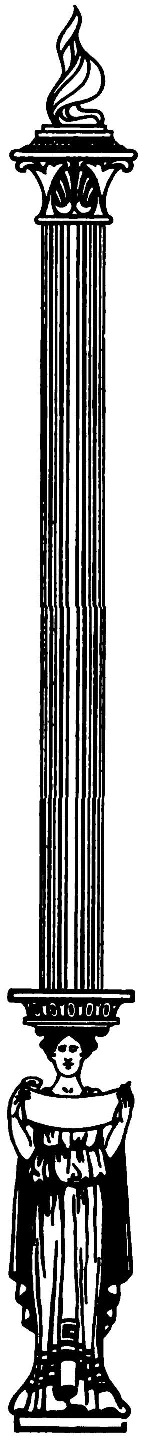

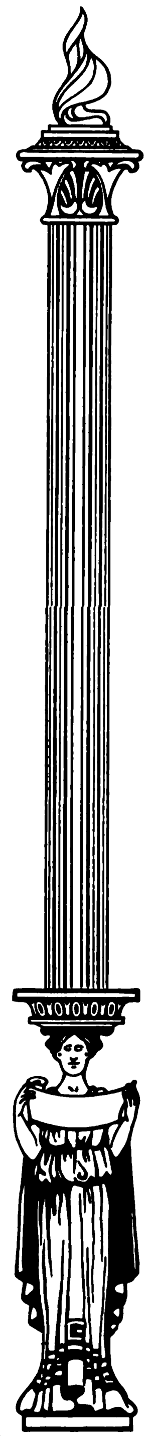

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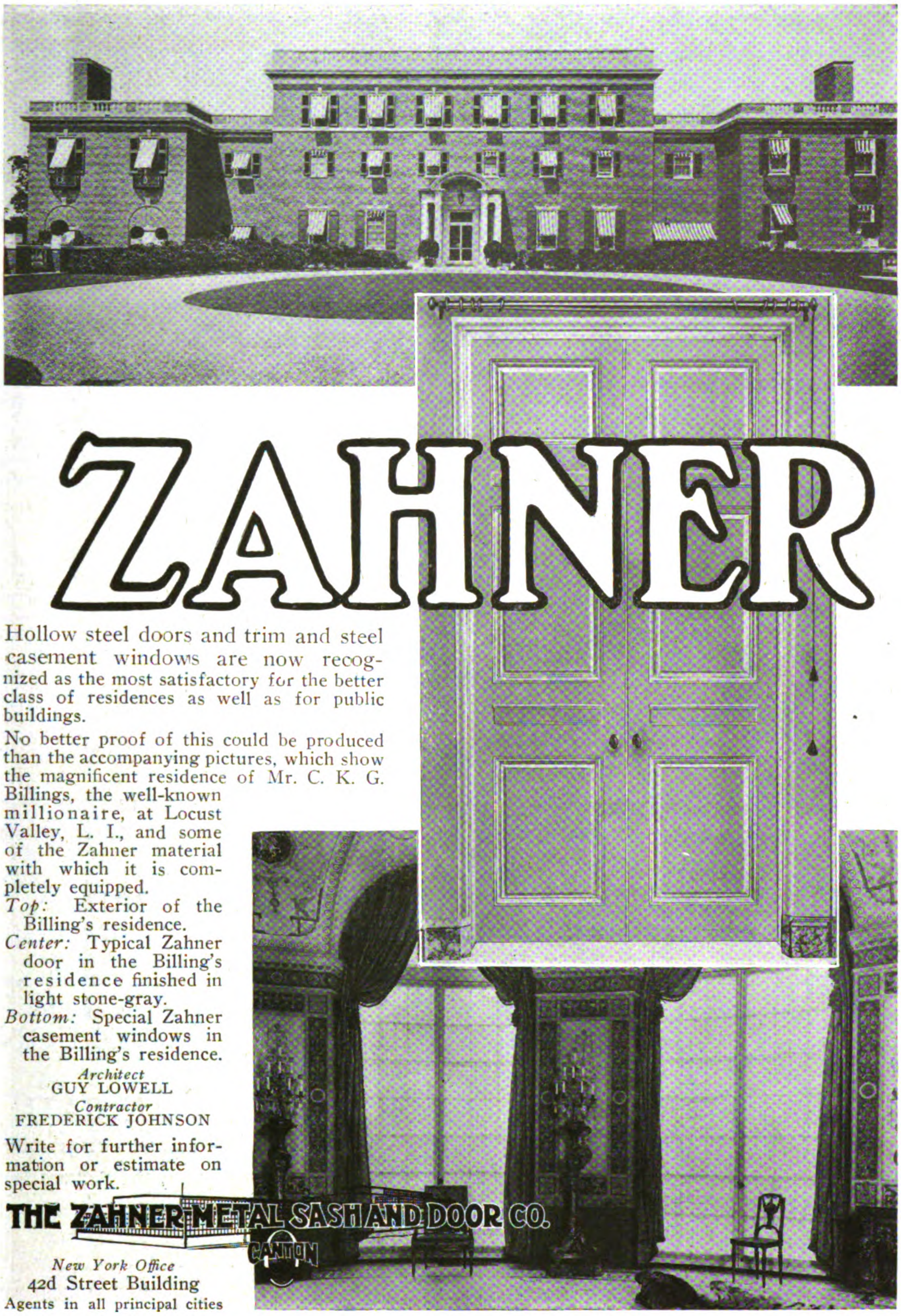

ZAHNER

Hollow steel doors and trim and steel casement windows are now recognized as the most satisfactory for the better class of residences as well as for public buildings.

No better proof of this could be produced than the accompanying pictures, which show the magnificent residence of Mr. C. K. G. Billings, the well-known millionaire, at Locust Valley, L. I., and some of the Zahner material with which it is completely equipped.

Top: Exterior of the Billing's residence.

Center: Typical Zahner door in the Billing's residence finished in light stone-gray.

Bottom: Special Zahner casement windows in the Billing's residence.

Architect
GUY LOWELL

Contractor
FREDERICK JOHNSON

Write for further information or estimate on special work.

THE ZAHNER METAL SASH AND DOOR CO.
CANTON

New York Office
42d Street Building
Agents in all principal cities

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Fireproofing Information Bureau

¶In establishing this complete reference service, manufacturers and others producing catalogs, house organs, price lists, etc., are requested to forward their printed matter and samples and place CONSTRVCTION on their permanent mailing lists.

¶The FIREPROOFING INFORMATION BUREAU is intended for the use of resident and visiting architects, engineers, contractors and the general business and professional firesafe building fraternity, as well as prospective building owners, to whom its use will be extended gratuitously.

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¶Prompt coöperation is solicited.

"CONSTRVCTION" TIMES BUILDING New York City

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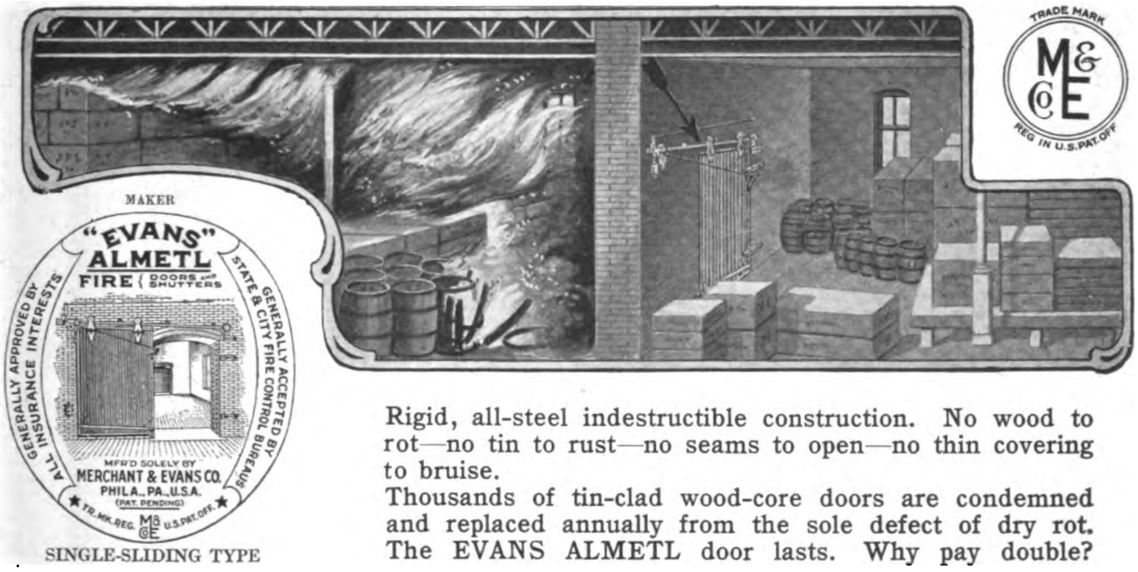
APPROVED BY UNDERWRITERS' LABORATORIES, CHICAGO

PATENTS PENDING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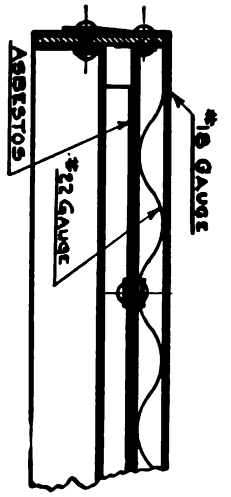
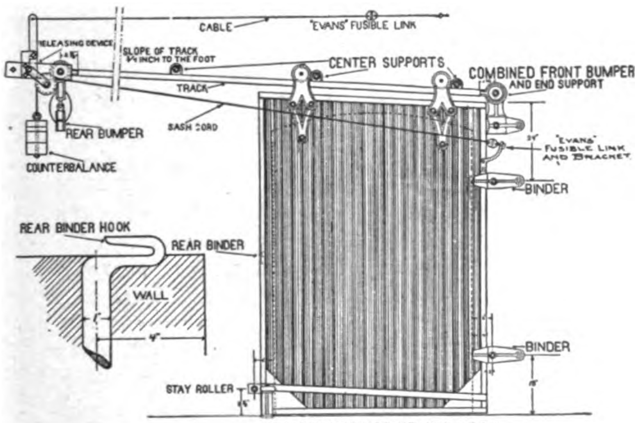


DESCRIPTION

A panel of standard 2½-inch corrugated 22 gauge galvanized steel interlined with ⅛-inch asbestos in a rigid frame of continuous $^3/_{16}$ by 2½-inch bar iron. Frame bound in a cover of 18 gauge galvanized steel forming a box for the panel and taking the abuse on the edge of door. Heavy corner gusset plates to prevent any sagging. Provision for expansion and contraction without distorting. The large heavy cross-laid corrugations give extreme strength while omission of the heavy wood core gives one-third lighter weight than ordinary doors. The large air spaces in the corrugations supplementing the thick asbestos give maximum resistance to heat. Thoroughly tested in actual service up to 8-feet by 10-feet openings.



"EVANS" ALMETL FIRE-DOOR
Detail showing erection of sliding type

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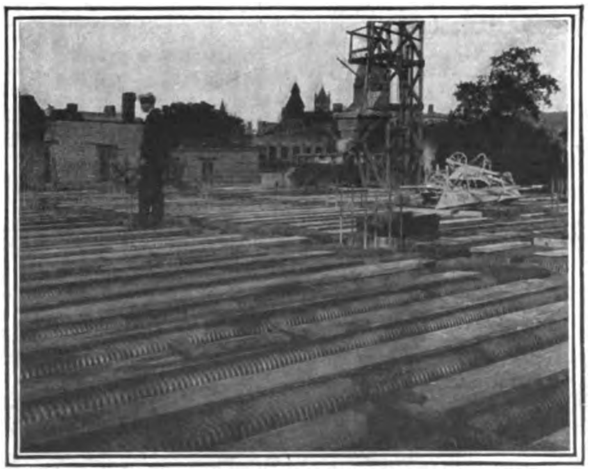
CHICAGO



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Contractor: WELLS BROS. CO., New York
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The first objective is attained (intensively) through the editorial, news and advertising sections of CONSTRVCTION and (extensively) by sending the magazine over the entire country to all the business and professional interests related to building planning, construction, equipment and maintenance.

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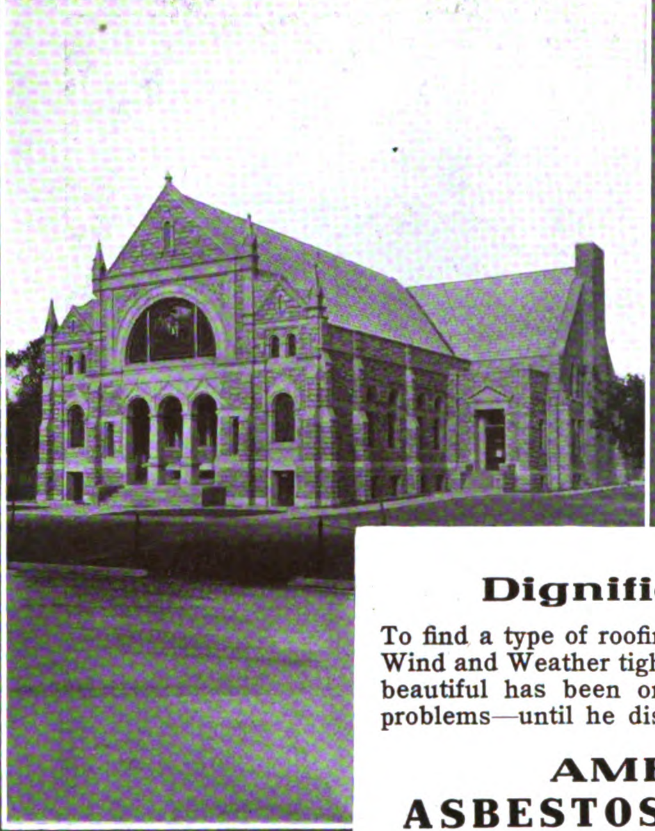

Central Congregational Church
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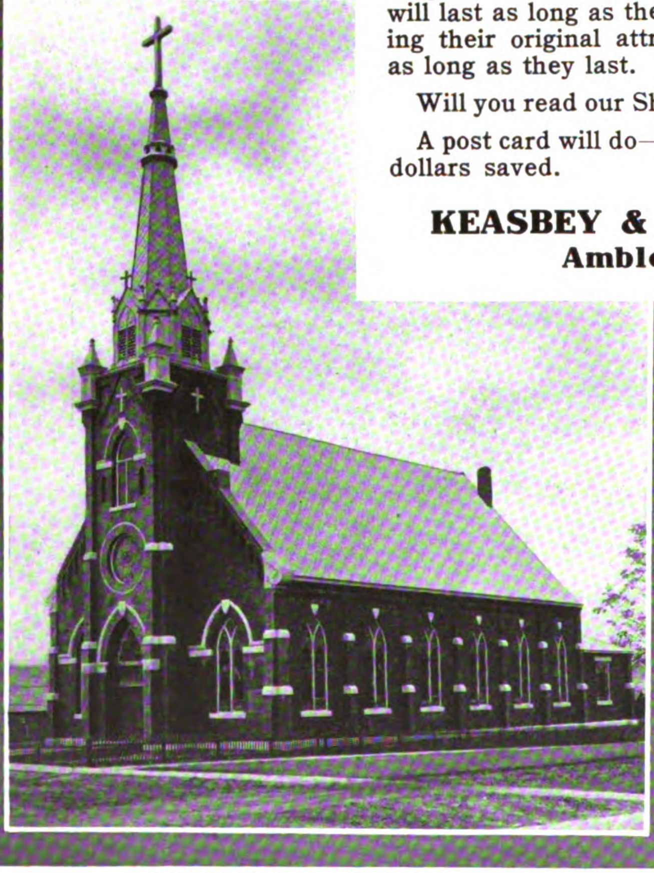
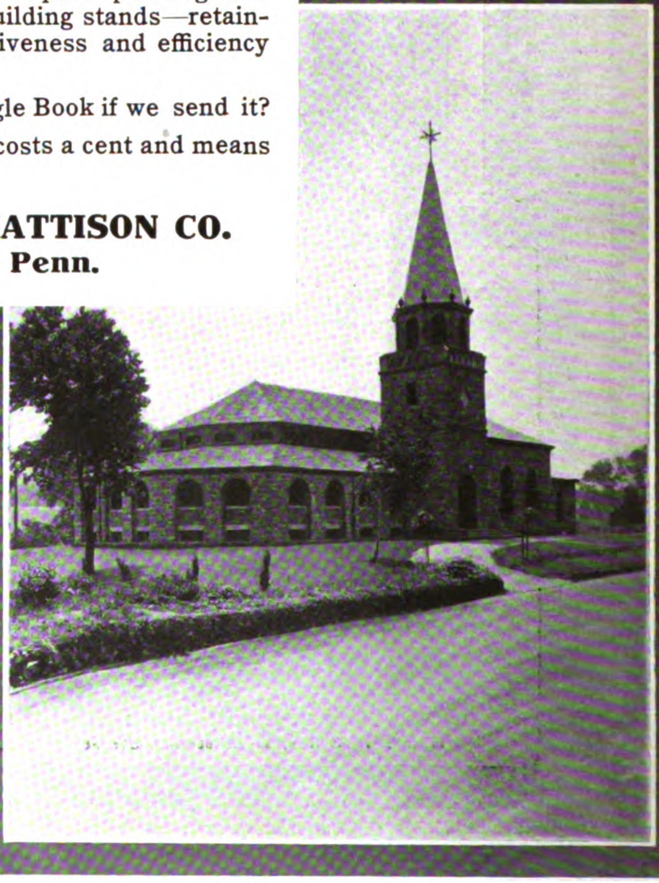


St. Bridgets Roman Catholic Church
Scanamon, Kansas



Vincent Methodist Episcopal Church
Nutley, N. J.

CONSTRUCTION
WITH A DEPARTMENT DEVOTED TO
SAFE HOMES

VOL. II APRIL, 1916 No. 4

Three Southern Cities Conflagration-Swept

Seven Lives, and Property Valued at Nearly $20,000,000, Lost in Fires at San Antonio, Paris, Nashville and Augusta

High Winds, Inproperly Constructed Buildings and the Baneful Wood Shingle Roof Form Powerful Combination for the Spread of the Flames

WITHIN the twenty-four hours from 5 o'clock on the morning of March 22, until the same hour the following day, large sections of the thriving Southern cities of Augusta, Ga., Paris, Tex., and Nashville, Tenn., had been swept by flames, blackened ruins and accumulated debris occupying the ground upon which formerly stood many imposing business structures and attractive residences.

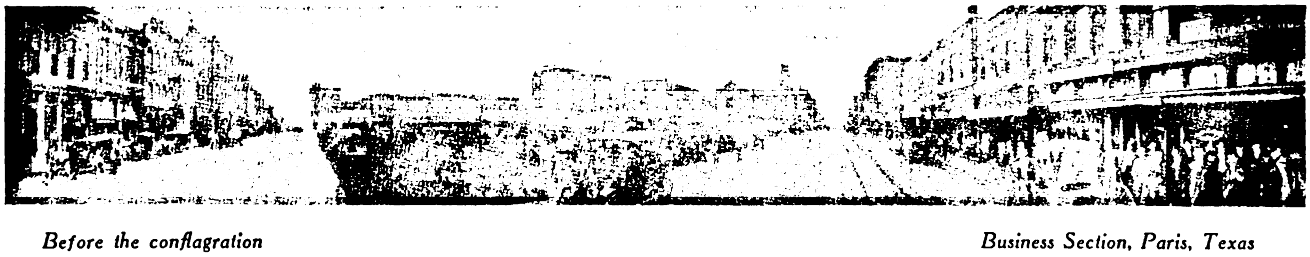
At San Antonio, during the same period, seven lives were lost in the burning of the County Club House, the destruction of which was so swift as to shut off all hope of escape for the occupants of several rooms on the upper story.

The immediate property loss in the three conflagrations above noted is estimated at $20,000,000. This, of course, takes no account of the destruction of valuable records, the interruption of business relations, which to progressive men means far more than the direct loss.

And the pity of it all is its utter needlessness. Had ordinary precautions in building methods been taken; had the counsel of the fire chiefs in the stricken cities—notably in Augusta—been heeded, and the menace of the wood shingle roof been abolished, it's a safe assumption that at all three centers the fires would have been confined to their respective points of origin, or at least to the territory immediately adjacent thereto. State Fire Marshals Thompson, of Tennessee, and English, of Texas; Fire Chiefs Reynolds, of Augusta, and Rozzetta, of Nashville, are in complete accord in such declaration.

The great outstanding lesson of the fires is that a repetition of such disasters can only be avoided by the adoption of proper building practices; consideration of the ultimate and not the immediate cost of structures, and the prohibition by State law or municipal ordinance of the use of combustible material in building practice, menacing thereby not only the structure immediately affected, but the entire community as well.

And above all else the **fire-brand wood shingle roof must go,** and in its stead incombustible coverings used on all types of buildings.



Before the conflagration *Business Section, Paris, Texas*

Worst Fire in History of Texas

WHAT proved to be the most disastrous fire in the history of Texas, and which must rank with the great conflagrations of the country, occurred at Paris on the 22d ultimo.

Starting in the storage warehouse of S. J. Long, at the foot of South Eighteenth street, the flames, driven by an unusually high wind, were soon beyond the control both of the local firemen and of the additional men and apparatus hastily summoned from Dallas, Sherman, Greenville and other points, and virtually burned themselves out for lack of fuel to feed upon. The wind was from the southwest, and in less than two hours' time a desolate waste was created, extending in width from Eighteenth to Twenty-fifth street, and from half-way up from the Texas and Pacific depot to the Central Square of the city, including many expensive mercantile properties; the Episcopal, Congregational and First Baptist churches; the Sunily Apartment House; the Belford Flats, a four-story structure erected a year ago; the new six-story Gibraltar Hotel; the Merrick Hotel and many other structures.

When the fire was burning in the southern section of the city, flying wood shingles carried by the winds ignited the roofs of dwellings in the northeast, which burned toward the business center until the two fires met, destroying meanwhile the Federal Building the new $100,000 Post Office, the Morgan Hotel and hundreds of other expensive properties.

In all 106 blocks—two-thirds of the city's area—were swept clean; 1440 buildings being destroyed.

A message from O. H. Lang, a prominent engineer of Dallas, to the *Engineering Record* of this city, says that but three buildings passed through the Paris conflagration "practically unharmed." These were of reinforced concrete construction. The concrete frame of the Gibraltar Hotel was damaged only slightly and the closed elevator and stair shafts with the overhead machinery were found to be in perfect working order.

"The gypsum-block partitions and wire glass and metal windows and reinforced concrete work were practically unharmed by the flames, while partitions, windows and buildings of materials other than these were practically destroyed. One concrete building was put to an additional test when dynamite was used to destroy surrounding buildings."

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How a conflagration sweeps clean a mercantile section where improper construction prevails

Official Account of Paris Fire

S. W. Inglish, State Fire Marshal of Texas

While the fire at Paris was still smouldering, S. W. Inglish, State Fire Marshal of Texas, accompanied by R. B. Godley, chief engineer of the Fire Insurance Commission, arrived in the stricken city from Austin, and at once began a thorough investigation into the cause and progress of the conflagration and the chief lessons to be derived therefrom.

From the Marshal's illuminating report we quote:

"The fire had its origin in a frame warehouse situated in the southwestern portion of the city, and, while the department's data gathered to this time would not now warrant a positive statement as to the cause of the fire, it is reasonably certain that its origin will in the final summing up be traced to carelessness.

"It appears that the alarm was sent in about 5.30 o'clock in the afternoon, and, notwithstanding the local fire department's prompt response to the call, a wind blowing out of the southwest at an estimated velocity of thirty-five miles per hour fanned the flames and scattered burning pieces of wood to such an extent that it was soon to be seen that a conflagration beyond the control of human agency was at hand.

The fire burned north-northeast from the place of origin, widening its area as it swept on until it burned itself out on the north and east side of the city, leaving now and then a scorched structure in its path, in almost every instance supporting a non-combustible roof covering.

"It is found that the entire area of the districts covered by the flames amounts to 264 acres of territory within the corporate boundaries and many small buildings, stables and outhouses outside the city proper.

Over 1,400 Buildings Destroyed

"One thousand four hundred and forty buildings shown on Sanborn, 1914, insurance map of the city were destroyed, 1,051 of which had combustible roofs, or 73 per cent of the total number of buildings lost. One thousand two hundred and ninety-seven of the total number of buildings burned were of frame or iron-clad construction, or 90 per cent of the total number of buildings destroyed. It is found that the fire consumed 704 homes of all classes, 75 frame mercantiles, 117 brick mercantiles, 522 outbuildings, such as barns, stables, garages, servants' houses, etc., 13 churches and 9 public buildings.

'The property loss is variously estimated at some $10,000,000 to $14,000,000, and, no doubt, falls within the range of such figures, but in the absence of reliable information as to the values of buildings and contents involved, this office is not now prepared to submit a statement thereon, nor can reliable data be furnished showing the total amount of insurance carried. It is probably sufficient to state that on account of the enviable good fire record borne by Paris for a number of years next preceding the occurrence of this loss that the fire insurance companies doing business in the State had, no doubt, been liberal in assuming liability and that the sound insurance in force will cover at least 50 per cent of the property loss sustained.

Attributable to Wood Shingle Roofs

"The swiftness and completeness of the destruction in Paris is probably without a parallel in the State, and, in some respects, not in the Nation. The destruction is even greater in its completeness and burned area than that of the Baltimore conflagration in proportion to population.

"Much valuable fire-prevention information is to be had from this conflagration that could be applied with profit by every city and town in the State. A most important lesson to be drawn is the hazard of the wood shingle roof. Modern history does not contain a more perfect example of the conflagration hazard that is present in every city or town where the shingle roof is prevalent. The burning of the business district of Paris was not due to a lack of fire fighters; it was not due to a lack of water; it was not due to the construction of the business district itself, but was primarily attributable to the wood shingle roofs of the residence section of the city. The firemen were not able to hold the blaze to the first building being burned for the reason that the brands carried by the high gale had set on fire buildings four, five, six and even ten blocks away, and in practically every instance the fire started on the roof of the building. These in turn would send their burning brands on the wings of the wind to other buildings with shingle roofs, until every dwelling on both the south and east sides of the business section was a seething, roaring mass of flames; and, notwithstanding the fact that the roofs of the business buildings had refused to take fire from the burning embers that had fallen upon them like a rain or hail for some time, when the half-circle of fire around the business district had closed in the intense heat of the wind-driven flames and the flying brands and

coals, which were many inches deep in the streets, broke through the windows and doors, and, when once an entrance was effected, the doom of the business section was sealed. Had the roofs of the dwellings in the path of the fire from its point of origin to the business district been of non-combustible material it is believed the fire department of Paris alone could have easily held the blaze to at least the block in which it originated."

Record of Buildings Burned

In all, 1,440 buildings were burned at Paris. According to the classification of the Texas Insurance Commission, 545 of the destroyed properties were one-story wood shingle dwellings., The full classification is as here given:

One-story frame shingle roof dwellings	545
One-story frame non-combustible roof dwellings	8
One ond one-half-story frame shingle roof dwellings	36
Two-story frame shingle roof dwellings	93
Two-story frame non-combustible roof dwellings	11
One-story frame shingle roof outhouses	274
One-story frame non-combustible roof outhouses	190
One and one-half-story frame non-combustible roof outhouses	8
Two-story frame non-combustible roof outhouses	3
Two-story frame shingle roof outhouses	19
Two-story frame non-combustible roof outhouses	3
Two-story brick non-combustible roof mercantiles	77
One-story brick non-combustible roof mercantiles	26
Three-story brick non-combustible roof mercantiles	12
Four-story brick non-combustible roof mercantiles	2
One-story frame shingle roof mercantiles	38
One-story frame single roof churches	9
One-story frame airdomes	2
Two-story iron clad picture theater	1
One-story iron-clad mercantiles	6
Two-story frame shingle roof mercantiles	5
One-story frame non-combustible roof mercantiles	23
Two-story brick non-combustible roof jail	1
Three-story stone courthouse	1
Two-story brick non-combustible roof dwellings	6
One-story brick shingle roof barns	2
Two-story brick non-combustible roof churches	3
Six-story fireproof office and hotel buildings (damaged)	2
Two-story fireproof postoffice	1
Three-story brick non-combustible roof Government building	1
Two-story brick non-combustible roof high school	1
One-story frame non-combustible roof lumber yard	1
One-story brick shingle roof church	1
Two and one-half-story brick shingle roof dwelling	1
Three-story brick non-combustible roof dwellings	2
One-story brick veneered non-combustible roof dwelling	1
Four-story fireproof apartment house (damaged)	1
Two and one-half-story brick non-combustible roof dwelling	1
Two-story brick shingle roof barns	2
Two and one-half-story frame shingle roof dwelling	1
Three-story brick shingle roof college	1
Two-story iron-clad mercantile	1
Total	1,440

Wire Glass Stands the Test

A striking example of the value of wired glass windows was afforded during the progress of the Paris conflagration.

"The Gibraltar Hotel was a six-story fireproof building, the main portion fronting on Main street, and the northeast portion of the building extending the full six stories, while the northwest corner of the building in the rear was but two stories in height. The dining room was located in this portion. The fire approached this building from the southwest, striking it from the front on Main street and from the southwest side. The windows on the southwest side both in the six-story portion and the rear two-story portion were of wired glass, and these windows are still intact, though the heat must have been terrific. The fire entered the building through the windows fronting on Main street, which were of ordinary glass, and also leaped across the roof of the two-story portion of the building on the southwest side, entering the windows of the six-story portion of the building beyond. These were of ordinary glass, as the builders considered that their own windows above the dining room were the only exposure. Had all of the windows in this building been of wired glass it is very doubtful indeed if the fire could have entered, as on the side where the fire was hottest the wired glass windows shut it out and proved their value beyond any question."

Rebuilding Plans Underway

Scarcely had the last spark in the Paris conflagration been extinguished before the citizens of the sorely stricken community, with characteristic energy and optimism, set about planning for rebuilding upon a basis vastly more secure and attractive than that employed formerly.

Appreciating the great lesson of the fire, the City Council promptly and without a dissenting voice adopted the building code of the National Board of Fire Underwriters, insuring thereby that all future construction work would be with a view to guarding against the fire menace.

A city engineer was secured from Kansas City, who will lay out a plan for the rebuilding of the city. In the general scheme the engineer utilizes the county court house, the proposed new postoffice and the Federal Court building, and provides for the city hall and a number of the wealthier churches which were burned and will be promptly rebuilt. He was very earnest in his recommendation of a civic committee or park commission, to whom all building plans or important undertakings should be submitted for approval before being presented to the building inspector. One of the chief purposes of the commission is to secure a degree of harmony in architectural development, which it was felt could be secured in no other way.

Three members of the Civic Development Commission—J. J. Culbertson, W. A. Collins and H. G. Armstrong—were appointed. These members were empowered to select four others, all of whom shall be by especially fittted for membership

Another feature of the plan particularly emphasized was the importance of providing at this particular time adequate uptown freight terminals, which will enable all wholesale houses now rebuilding to have their warehouses upon unloading tracks and at the same time be immediately adjacent to the retail district. The whole scheme of rezoning the city, thus creating a retail section, a wholesale and jobbing district, factory groups, a market square and residence section freed from stores and other commercial or industrial plants, whether of large or small capacity, was carefully gone into.

682 Buildings Completely Destroyed at Augusta, Ga.

THIRTY-TWO blocks in the business and residential sections of Augusta, Ga., were flame-swept on March 22d. In all, 682 buildings—113 of the number being brick, and 569 frame or frame, metal-clad—were destroyed, their estimated value being placed at nearly $5,000,000.

The fire began in the first office building built in the city, on the oldest business block on Broad street, and spread in less than half an hour to the block east that held every new building that has been constructed in the past five years—buildings of the most modern design and architecture.

Burning north from the Dyer Building, the origin of the fire, flames destroyed Warren block, on Jackson street, and the cotton warehouses in the rear, owned by Jacob Phinizy and Mrs. Frank Doremus. Leaping across Jackson street, the fire next claimed the new Union Savings Bank Building, constructed less than three years ago. Again eating its way northward, the fire destroyed a number of cotton brokerage offices, insurance offices and ship brokerage offices, all owned by Dr. W. H. Harrison. These offices were occupied by F. Phinizy & Co., W. Z. Carwile, the Windsor Spring Company, Cates & Co., Doremus & Co. and H. Gould Barrett.

The Cotton Exchange and Board of Trade Building, across Reynolds street from the Harrison property, was only partly damaged, and late quotations are being received as well as the crippled wire service will permit. The fire continued east on the south side of Reynolds street, however, whipping around the giant seventeen-story Empire Life Building thath fronts on Broad street, but which is not yet completed. What little woodwork there was about it burned, damaging the structure about $100,000 worth.

The Clarke & Butt cotton warehouse, on the north side of Reynolds street, was slightly damaged, the flames, however, seeming to choose the Tubman High School, next doors, which was burned to the ground. A number of small structures on the same block of Reynolds street, but on the opposite side, were all destroyed. Among them was the Perroux & Jones garage, the office of Reid & Co., and a brick residence on the corner.

A scene in Augusta after the conflagration which destroyed 10 business and 20 residential blocks, with a loss of $5,000,000

From the Union Savings Bank, on Broad street, the flames worked their way to the new "Chronicle" Building, completely gutting it, and the "Herald" Building, the Commercial Club, the Phinizy Building and the Masonic Temple were burned to the ground. The old Masonic Temple was destroyed in a fire on the opposite side of Broad street over fifteen years ago, and the present building was new.

The old Irish-American Bank was next destroyed, the fireproof walls of the Citizens' and Southern Bank stopping the flames on the Broad street front. This also saved the Planters' Loan and Savings Bank and the Georgia Railroad Bank, on the corner of Broad and McIntosh streets.

Fanned by a terrific gale, however, the flames again ate their way northward to Reynolds street, and skipping Broad for a block until Washington was reached, burned out the Russell cotton warehouses, on Reynolds street, and historic St. Paul's Episcopal Church, adjoining.

After jumping that part of the 700 block of Broad street from the Citizens' and Southern Bank east and the entire 600 block bounded by McIntosh and Washington streets, the flames again spread through from Reynolds to Broad, sweeping everything in their path, north to the river and east to the city limits.

When the fire passed Center street, the site of the old city market of reconstruction days, it continued in a path extending from the Savanah River on the north, through Reynolds street to the north side of Broad street and as far east as Elbert street, which intersects lower Broad, a part of the fashionable residential district.

The palatial residence of Thomas Barrett, former Mayor of Augusta, was the first on that block to go. The home of Frank Barrett, his son, had burned on the block above, only half an hour before.

The residence of Leonard Phinizy, capitalist, next door to the Barrett home, was likewise destroyed, along with the old James McGowan home, just east of it. The Gould residence, adjoining the former McGowan property, was burned to the ground. Thi was one of the oldest and most artistocratic homes in the entire city, and had been occupied for many generations by the Goulds. The Fisher home and the residence of George Fargo, both magnificent private homes, at the end of the block, also burned.

On the next block on Broad street the fire destroyed the homes of Hugh Alexander and James L. Robertson, one of Augusta's pioneer citizens and identified with "Cotton Row" for nearly half a century.

At Elbert street the flames crossed to the south side of Broad street, and, aided by the high wind, tore their way through Ellis street and then to lower Green street, carrying many fine residences and the Houghton grammar school, the second school building to fall to their prey.

The fire was then raging at its worst from the river southward to the 300 blocks on Bay, Reynolds, Broad, Ellis and Greene streets. It continued east in its path then and burned out a path four blocks wide to East Boundary, where there was nothing more left to burn.

Official Account of Atlanta Fire

Chief Reynolds on Georgia's Greatest Fire

Fire Chief Reynolds, according to an interview given the "Augusta Chronicle," holds the poor type of construction of the buildings in the pathway of the fire responsible for their destruction, rather than attributing responsibility to the high wind blowing at the time.

"In the first place," said the chief, "the fire was bound to have been a big one, owing to the nature of the Dyer Building. Several times he has gone on record as stating that if ever a fire gained any headway in it there was no hope of saving it, and work would have to be confined to saving adjoining property.

"The chief called attention to the many open windows in the Dyer Building. These made an additional draft so great that on the Jackson street side papers in various offices were sucked into the street like snow storms, there to be caught by the gusts of wind and whirled skyward.

"The building itself was a fire trap because of the open elevator shaft, added to wooden stairways circling the shaft, concrete floors laid over wooden supports, never intended to stand the weight, and inadequate fire-escapes. The chief says every fireman knows that where stairs are constructed around elevator shafts open to the flames and the fire breaks out in the lower floors escape is always cut off. He says he tried to force the construction of balcony escapes on this building, but was not successful, owing to lax building laws and inadequate enforcement of those we have. The escape on the front was just a ladder and was not the kind women should be forced to use. He added that it was just a miracle and cool-headedness on the part of the men that enabled so many to get down that narrow way successfully. The wonder of it is that there was no loss of life right there.

"Knowing the heavy weight on the floors, the chief sent his men out as soon as the heat became great and, just as expected, the floors began dropping through before many minutes.

"With the whole interior a seething furnace, the glasses blew out and the flames shot out across the street, igniting the wooden frames of the windows in the Union Bank Building. As soon as these fell out the flames rushed in, and soon that, too, was a mass of fire. * * * *

Faulty Construction

"That he warned Augusta of the danger is proved by the chief's annual report to council the first of the year. He said last night that under our present laws governing construction it seemed that people were desirous of building a fine-appearing building in front and then grew careless of the backs. The Broad street façades are mighty nice looking, but in the back they are not protected. Exposed wooden stairways, wooden balconies and porches and outhouses of the flimsiest construction are all menaces in time of fire, especially when a high wind is blowing great embers and sparks at a high rate.

"The chief is very severe on shingle roofs. He points out that the fire did not jump Broad street until it reached the shingle-roof district. On lower Broad street there was less reason for its crossing than uptown, because the trees act as a natural shield against the heat. House after house down there ignited on the roof, and once aflame the weather boarding of the adjacent house was soon also in flames.

"The chief says it was probably the woodwork in the tower of St. Paul's that first caught, judging from the fire as he first saw it, and it was the wooden outbuildings that put the fire beyond the Empire Building.

"The plan of the department was to prevent the spread of the original fire westward, and then to kill it in the structures west of the Empire Building, and this would have been done had it not been for the numerous fires that broke out in the rear of the buildings on Broad street. Many of these had slate or other non-inflammable roofs, and should have aided the firemen, but the structural weaknesses in the rear caused all the trouble. When it was seen that it was in the rear of "The Chronicle" Building, for instance, lines of hose were run through this structure and a determined fight made to conquer it there, but the building to the back went up in a few minutes, and the men were forced out in the densest of smokes barely in time to save their lives.

"Another fight was made at the Irish-American Bank Building. It, too, the chief describes, was all front. The rear was thinly covered with tin, which, as soon as it got red hot, ignited the wood underneath, and the glass of the skylight breaking, let in the destruction to the wooded work in the interior.

"But the Citizens' and Southern Bank, solidly constructed, with a fine wall, acted a real firebreak, and, though at one time afire at the base of the flagstaff, which the chief says should not be of wood, enabled the fire-fighters to stop the progress of the flames. The Elks' Building, too, would have burned if its roof had been wooden. As it was, the only wood exposed was in a little cupola, which at one time blazed fiercely, and the fire had entered under the roofing when the men got to work on it.

"As fast as whipped at one point the workers shifted to another, but not always the next house, for some were just fire-traps and could not be saved, once endangered. Favorable spots were always selected. The Alexander home, on lower Broad, was one of these, and, though it was not saved, owing to inadequate water, the character of the building enabled the firemen to stop the fire from eating further westward. It was one of the deciding points in the great struggle.

"Abolish Shingle Roofs"

"Mr. Reynolds says he is glad to see the adoption of the slogan: Let's build a better Augusta.',He adds that unless the building is better, another great conflagration is always threatening. There are other buildings here now, he says, as dangerous as the Dyer, and if ever a fire breaks out in them and gets headway it will take more men and more apparatus than Augusta can afford to keep ready.

"The first need is to adopt the building code of the National Board of Fire Underwriters, and then see that its regulations are enforced without fear or favor.

"Secondly, larger water mains in the congested district and an arrangement whereby high pressure can be maintained throughout a special stress period, such as Wednesday night.

All shingle roofs should be abolished, of course, and the backs of buildings should be made with the fire risk in mind.

"The chief says he doesn't believe in anything being all front. It is what is behind the pleasant-appearing exterior that counts in most cases. And when it comes to fire-fighting it is the back that counts most often."

Sprinklered Property

At East Nashville, Tenn., the fire being confined strictly to the residential section, no sprinklered properties were involved.

Paris, Texas, lost two buildings having sprinkler equipment—the Crook Record Company and the Northern Texas Dry Goods Company. In both instances the protective system opened promptly, and would unquestionably have prevented loss had it not been for the exterior flames, which the entire fire-fighting force of the city, together with that summoned from outside communities, were unable to cope with.

At Augusta a number of the large cotton warehouses had thoroughly modern sprinkler equipment, water therefor being supplied from a 100,000-gallon auxiliary tank located in the center of a square. An interesting account of the saving of these warehouses is given by Walton H. Griffith, special agent for one of the fire insurance companies. Mr. Griffith said:

"I was in the office of our present agent while the fire was raging, and, remembering that we had a heavy line written by our former agents on the Pope & Fleming sprinklered cotton warehouse buildings and contents on Reynolds street, and realizing that the fire was getting beyond control and that the wind was driving the flames straight towards the cotton warehouses referred to, only a short block away, our agent and I placed everything movable and of value into his office vault and made a dash to the cotton warehouse to be of assistance if possible.

"We found every compartment of these warehouses open, cotton in the courts, and no one in sight—the cotton men presumably having rushed around the block to the original start of the fire, and not realizing the danger of the fire extending to these warehouses. Securing assistance from negro passers-by and enlisting everyone possible, we either personally closed or directed the closing of all the compartments except two at the far end, had the yard hose attached and set a negro to work wetting down the court cotton and the frame ends of the warehouse nearest the approaching fire. Less than ten minutes after we had started work an explosion of gasoline in an auto garage across the street set fire to two unsprinklered warehouses directly opposite, and only the wetting down of the court cotton saved it from the hail of sparks which followed. By this time the warehouse men had returned, directed the work of wetting down and storing all the court cotton into a vacant compartment, and succeeded in closing all the compartments without losing a single bale. Later on, as the fire across the street developed intensity and swept into the block where the warehouses were located, the curtain sprinklers were opened and ran steadily for hours, protecting the frame compartment ends from heat and sparks; but it was the double brick walls of Clark & Butts' sprinklered compartment which finally checked the spread of the fire in this direction."

Failed to Heed Previous Warning

Augustans had been fairly warned of the dangerous fire conditions in their city, and the public officials who failed to heed and profit by the lessons of the Riverside Compress fire of some months ago should be held to strict accountability by the citizens of the community above noted.

In treating of the fire and the lessons to be derived therefrom, the Augusta *Chronicle* of late date, said in part:

"The lack of sprinklers, a metal roof shed and fire walls is the greatest lesson to be learned from the fire. With 7,000 bales of cotton stored at the Riverside, the majority of which were on a great platform with a shed covering it, the fire hazard was too great without sprinklers and with only one fire wall. The shed, which covered the cotton platforms, was highly imflamable.

Sprinkler Protection

"There was only one fire wall and there should have been several. At the Atlantic States Warehouse, which, by the way has the only compress in Augusta, with a sprinkler system, there are numerous compartments for cotton (nearly 100, in fact), the capacity of each being 1,000 bales of cotton, standing on end. It would be impossible for fire to get out of one compartment into another. There are also numerous warehouses on cotton now equipped with sprinklers.

Then, too, there is a sprinkler system in every compartment in the Atlantic States, and in the compress itself with tanks of water of sufficient capacity to arrest a fire before it gains any great headway.

A Near Conflagration

"If the Riverside is rebuilt where it is, the city authorities will undoubtedly insist upon fire walls, automatic closing doors between the compartments, a sprinkler system and a tank with sufficient capacity.

* * * * *

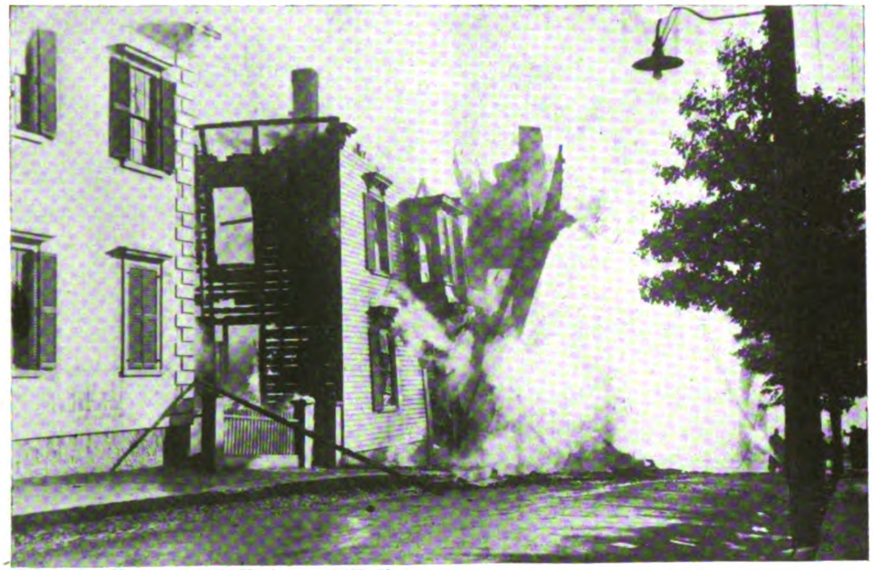
Deadly Wood Shingle Roofs

"Then there is a lesson of wood-shingle roofs in the fire district. There is a city ordinance prohibiting wooden shingle roofs in the section between Fifth and Fifteenth streets, and from the river to Gwinnette street. This went into effect several years ago. There was an ordinance which prohibited wood-shingle roofs in any section of the city, but the council repealel that and fixed the boundaries of the incombustible roof district at Gwinnett street on the south; Fifteenth street on the west; Fifth street on the east, and the river on the north. All roofs covered with wood shingles in the fire district are not to be replaced with the same type of covering." This proper ordinance was largely nullified through the practice of "repairing" worn out roofs with the deadly wood shingle, which, when the recent serious fire occurred, furnished ready fuel for the spread of the devastating flame."

Nashville Fire Loss Approximates Two Million Dollars

A LIGHTED ball of yarn thrown into a grassy vacant lot by a young colored boy started a fire at Nashville, Tenn., on the afternoon of March 22d that for a time threatened the complete destruction of the city. Before the flames had been checked thirty blocks were swept bare; nearly seven hundred residences in ashes, and an estimated property loss of $2,000,000 incurred.

A planing mill first was destroyed. The flames quickly spread to an extensive negro settlement, where, fanned by a high wind, every house was consumed. The conflagration then broke into two distinct blazes, one flowing east on Seventh street and the other down Fifth avenue. An area of thirty blocks was swept clean, which included many of the costliest residences of Nashville, several churches and one charitable institution. After paralleling each other and separate streets for many blocks, the two fires again joined.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The unsafe frame dwelling

Much church property and many homes of pastors were destroyed. The churches burned were: St. Columbia Catholic, Woodland Street Presbyterian, Woodland Street Christian, and an old negro church. Tulip Street Methodist and Edgefield Baptist churches were damaged, the former slightly. Among the ministers losing homes were Revs. L. Lincore, W. L. Caldwell, William Lunsford, J. W. Gillon, the secretary of the Baptist State Mission Board. Among others losing homes were J. D. McAlister, superintendent of the Anti-Saloon League; J. Washington Moore, assistant County Attorney-General; M. B. Morton, managing editor of "The Banner"; Martin Clark, assistant advertising manager of "The Banner."

The fire traveled on the wings of the wind, and where homes were burned the contents went also.

The fire department worked desperately, but the gale rendered their efforts useless. Streams of water turned toward burning houses were blown aside. The drive of the wind, falling walls and screams of frightened women and children made a terrific din.

Appeals for additional fire-fighting apparatus were sent to several nearby cities, but none could get here in time to help.

Bucket brigades were formed and tons of water were thrown on buildings at important points in an effort to check or divert the fire. Meanwhile, ambulances were dashing about picking up persons hurt by falling walls or objects thrown from windows.

The flames were finally brought under control when the wind subsided and the fire had partially burned itself out.

Speaking of the fire, Chief Rozetta of the Fire Department said: "The wind, blowing at the rate of 50 miles an hour, carried burning embers for blocks. Houses away up on Main street were beginning to blaze up—their roofs ignited by the flying sparks. The breaking out of fires in different parts of the city at the same time made almost impossible the task of the firemen, whose principal energies were directed toward preventing the spread of the flames toward the business district."

Official Account of Nashville Fire

Charles W. Schuyler, Fire Prevention Commissioner of Tennessee

AN eyewitness of the East Nashville conflagration, Charles W. Schuyler, Fire Prevention Commissioner, State of Tennessee, tells of its progress and how a repetition of the disaster may be safeguarded against, in the following brief but comprehensive statement:

"This started at the rear of property owned by Mr. P. S. Gordon, at 212 and 214 west side of First street, and laid to waste thirty-six blocks of mostly residence property. A three-room negro residence stood on the rear of 212, which was occupied by Lizzie Carter; a one-story and basement frame, ironclad planing mill, 60 by 175 feet, stood at 214, which was occupied by J. M. Seagraves. This mill was not running, and had not run since the previous day.

"There was no fire in the mill, nor had there been that day.

"A three-phase induction motor furnished power to operate the planing mill.

"The fire was discovered in the rear basement of the planing mill by an old colored woman by the name of Sallie McClain, who immediately gave the alarm; but the wind was blowing fifty miles an hour toward the front of the mill, and the dry pine building and pine lumber within was ablaze in a flash. With the terrific wind driving the flames like a forge, same was blown through the front of the mill and to the concrete street, blistering street badly and burning the poles which carried the electric wires. These poles were then consumed and the live wires fell, and at the same time the fire was communicated to three dwellings across First street, the conflagration which devastated a portion of beautiful East Nashville was beyond control of any human element.

"One of the greatest hazards to the spread of fire is the wood shingle or combustible roof. Firebrands will fly, and when they light on dry, inflammable material ignition is certain, and this in turn throws off other firebrands to start other fires.

"Another cause of the East Nashville fire spreading was the dry grass and rubbish in yards, light, wood fences and frame unprotected outhouses. All the above are spreaders of fire. From a distance, any house will burn from an adjoining fire.

Better and as Cheap as Wood

"Non-inflammable roofing material, fencing and outhousing can be had that will look as well, be purchased as cheaply and constructed as cheaply as wood, and no honest lumberman or contractor interested in the safety or welfare of his community will deny this statement.

"Besides the danger from fire, if the yards are fenced with wire fencing, the premises will be kept cleaner, will be much more sanitary and decidedly more beautiful. Let us all "pull together" for a better, safer, healthier and more beautiful city and State.

"The fire, driven by such high wind, jumped by leaps and bounds for many blocks at a time. In one instance, to my personal observation and knowledge, from north of the L. & N. Railroad to a house with a shingle roof south of Woodland street, a distance of at least nine blocks, a blazing ember fell on the dry roof, which flared up immediately, and as fast as the shingles were burned loose they were wafted over the comb of the roof and carried along by the wind to start other fires.

"Much of the loss in Tennessee can be eliminated by safer construction and a reasonable amount of care.

"The people are paying for the fire losses, and not the insurance companies. The insurance companies simply collect the insurance premiums and distribute the same to the insured who have a fire, and regardless of whether you were in the burned district or whether you own or insure property, you are paying your share for the clothes you wear from the time same leaves the sheep's back or the cotton field, and the food you consume from the time it reaches the markets until purchased by the consumer is insured, and the greater the fire loss, the higher the insurance rate. You can rest assured that no insurance company, or any other kind of company, will continue in a losing business, and the premium is, and must be, based on the loss ratio. There are now forty-six of the large fire insurance companies not doing business in the State of Tennessee because the loss is so great here.

A National Shame

"Statistical records show conclusively that 80 per cent of the fires in America are preventable. This is a national shame. Tennesseeans are a proud people; have, and always will, bear their share of the nation's burden, and there can be no better cause than the conservation of life and property. We have just been taught an expensive lesson in the art of carelessness; let us resolve that there shall not be a repetition of this great disaster in Nashville or Tennessee again.

"Just think for a moment of the probable result should this fire have originated beyond Capitol hill in the warehouse district on Harrison street. There would be no Nashville to-day and the loss would have been inconceivable. Such loss is gone forever and can never be returned; it is that much of the nation's value wiped off the earth.

"In conclusion, I want to commend the State, county and city authorities for their prompt action and aid to the distressed, and especially to Chief Rozetta and his brave firemen, who used splendid judgment in confining their energies to the side lines. The wisdom displayed in this movement saved equally as much property as was lost, and it seems an impossible feat to have kept the burned area so narrow."

and brings to memory—

Vampire Three

"Wind, water and fire, in this case:

Fire Speaks

I am a vassal of man, and I do his will in many a mavelous way;
If he chain me, sure I am fain to endure his mastery night and day;
But should I escape from my dungeon red, to follow where embers fly,
I chasten my master with hell's disaster, and flaunt my head to the sky.
—O. H. Roesner, in N. F. P. A. Magazine.

"The above verse is a striking illustration of what occurred in the East Nashville fire. Generally speaking, all fires are the same size when they start. This brings to our minds in a very forcible way what a little match can do, and this great loss to Nashville and our citizens should in time be a benefit, for it has been shown that our property will burn as freely as that of Chicago, New York, Baltimore, San Francisco and other places, and will certainly cause the good people of Nashville, Tenn., and the entire South to practice and demand care in building from their neighbors.

Provide for Their Safety in Future

Paris, Nashville and Augusta have profited by the lessons of the conflagrations, and in each of the cities new building ordinances have been adopted, the proper observance of which should make impossible a recurrence of fire upon anything like so serious a scale.

At Paris both the National Building Code and the National Electric Code, as promulgated by the Texas State Fire Insurance Commission, were adopted by the city council on the 27th ultimo, and all future building in the city must be in conformity therewith.

Extend Fire Limits at Nashville

Impressed by the need for widely extending the fire limits of their city, the Board of Commissioners of Nashville, Tenn., on March 30, unanimously adopted the subjoined, which forms an addition to the previous ordinance upon the subject:

"Be it enacted by the Board of Commissioners of the city of Nashville:

"Section 1. That the following area shall be within the fire limits of Nashville, Tenn., to wit; Beginning at a point 200 feet north of an extended line of Main street, where it intersects with the Cumberland river, thence extending eastwardly along said line and parallel with Main street and on the north side thereof, to the Gallatin road, thence northwardly 200 feet west of said Gallatin road to Eastland avenue, thence eastward 200 feet east of Eastland avenue to Sixteenth street, thence 200 feet southwardly east of Sixteenth street to Woodland street, thence 200 feet southward of Woodland street to Fourteenth street, thence southwardly along the center of Fourteenth street to Shelby avenue, thence 200 feet south of Shelby avenue to Tenth street, thence 200 feet southwardly east of Tenth street to Dews street, thence 200 feet westwardly, south of Dews street and an extended line of same to Fifth street, thence 200 feet northward, west of Fifth street to Shelby avenue, thence 200 feet westward, south of Shelby avenue and the Sparkman street bridge viaduct to the Cumberland river, thence northward with Cumberland river to the beginning point; provided, however, that where there is an alley back of the street line, these boundaries are intended to apply to the alley lines, except where the center of the street is made the line.

"Sec. 2. That the provisions, limitations and requirements applicable to the second fire zone of the city of Nashville shall apply to the above fire zone.

"Sec. 3. That this ordinance shall take effect from and after its passage, the welfare of the city requiring it."

Montgomery, Ala., in Line

Wood shingles as a roof covering received a solar-plexus blow at Montgomery, Ala., through the recent passage of a local ordinance prohibiting their further use within the city limit. A cry of anguish went up from the lumber dealers, whose final petition was that enforcement of the safety measure be deferred for thirty days "in order that they might dispose of the large stock of wooden shingles they had on hand."

Fire underwriters vigorously opposed the request for delay, asserting that the insurance men had been working three years for the enactment of such an ordinance, the need for which had been forcefully emphasized by the recent disasters at Paris, Augusta and Nashville. F. O. Hawkins, spokesman for the underwriters, said that there is an organized effort throughout the country on the part of certain interests to oppose any legislation, either municipal or Sate, which might curtail the use of wood in the construction of houses. In support of the argument that the ordinance should stand, he pointed out that many lumber companies covered the roofs of their own mills with metal, and drew the conclusion that it is an injustice for them to wish to continue to sacrifice human lives by covering dwellings, in which people lived and slept, with wood or any other combustible substance when they will not use it even on their places of business.

He stated that the example of the conflagrations of San Francisco, Jacksonville, Baltimore, Salem and the recent terrible fires in Nashville, Augusta and Paris, Tex., prove that shingle roofs and frame houses are instrumental in spreading the fires. Out of six hundred and twenty-five alarms, he stated, answered by the fire department of Montgomery in 1915, three hundred and three of them were on account of shingle roofs.

Albert D. Kohn said that in two years' experience in which he had compiled data regarding the origin of fires, losses from which were paid from his office, all the fires except one were caused by shingle roofs.

The Recently Adopted Ordinance

"To amend an ordinance entitled an ordinance to regulate the construction and repairing of roofs in the city of Montgomery.

"Be it ordained by the Board of Commissioners of the City of Montgomery as follows:

"That an ordinance entitled an ordinance to regulate the construction and repairing of roofs in the City of Montgomery, adopted February 2, 1916, be amended so as to read as follows:

"That no building or structure in the city limits of Montgomery shall, after the first day of April, 1916, be covered or repaired with wooden shingles; provided that if any roof is deteriorated or damaged not more than 25 per cent, such deteriorated and damaged portion of said roof may be repaired with the same kind of roofing as the undamaged or undeteriorated part. No wooden shingles shall be placed on any roof of any building or structure within the corporate limits of the City of Montgomery without first obtaining a permit for same from the City Building Inspector, which permit shall specify the repairs to be allowed."

Safety Code for Augusta

With but one dissenting vote, the City Council of Augusta, Ga., on April 6th adopted the building code recommended for it by the National Boarl of Fire Underwriters.

Under its provisions the fire district of the city is extended and the conflagration-breeding wood shingle roof is outlawed.

Existing wood shingled roofs, when replaced, must substitute non-combustible material. If 10 per cent of a combustible roof within the fire district requires renewal, safety material is required. Outside the fire limit 25 per cent repairs are permitted before incombustible covering is required.

Atlanta Fire Chief Sounds Warning

Commenting on the Augusta disaster, Fire Chief William B. Cody, of Atlanta, Ga., said:

"There could be no better time than this to emphasize and repeat what I have contended for years—that, unless Atlanta does away with shingle roofs in the business district and unless she see to it that this district is better equipped with automatic sprinklers, she stands the risk at any time of facing such a disastrous fire as that which swept Augusta and Nashville."

"Anyone who is familiar with the history of the South recalls the fires which occasionally nearly destroy a city. There is a big chance of such a fire devastating Atlanta unless more stringent fire protection laws are adopted.

"At the Marbut-Thornton fire, Wednesday night, the department had hard work to prevent a general conflagration. The high wind from the west was shooting the flames eastward and it was necessary for me to take five companies of firemen and soak with water all of the shingle roofs for four blocks east of the blaze."

Daily Press Condemns Wood in Building Construction

Menace of Inflammable Buildings

(Morning News, Dallas, Texas)

It seems that the belief in San Antonio is that the fire which destroyed the Country Club of that city, and took six lives as its human toll, originated in a collection of paints and oils that had been stored in the basement. The fire in Houston, resulting in a property loss of $500,000, is said to have started in a trash heap in the railroad yards. If these explanations are true, they exemplify again what every one has long known, that the greater part of our fire losses are due to negligence, to carelessness of almost criminal degree. The precautions that we take against the outbreak of fires are of the most indifferent and slovenly kind; they lack much of measuring up to the precautions which an ordinary sense of prudence ought to suggest to a people whose building construction is of an unusually inflammable kind, and whose buildings at the end of long seasons of dry weather are almost tinder-like in their susceptibility to fire. We have inspectors of various kinds, but we lack the kind of inspection that we are probably most in need of. We ought to have an inspection which would concern itself not alone with the flues or electric wiring, but with the habits of the people who occupy premises for the purpose of bringing about an abandonment of common practices which increase the fire hazards.

There is no matter more urgently demanding study than this of our fire waste. It is a debilitating and growing tax on the productive energies of the State, so let no one delude himself with the idea that we can fasten this loss on the insurance companies permanently. Temporarily we may, but they will accept it only temporarily. Either we must allow them to recoup their losses in Texas from increased rates of premium, or we shall have to make shift to get on without insurance. This last, of course, can not be done without bringing disaster to the State. It is a possible rather than a practicable alternative. It is said that in the Paris fire alone the companies lost more than half the amount of the premiums collected in Texas during the whole of last year. If to this loss we add the other losses they have sustained within the last week and then, to this total, super-add the cost of doing business, which is probably 35 per cent of the premiums collected, it will be seen that any hope they may entertain of getting even in Texas must be set far in the future for its realization.

Shingle Roofs Should Be Outlawed

(Morning News, Dallas, Texas)

To speak of the Paris fire as one of the greatest Texas has ever known is to minimize it absurdly. Such a visitation of fire no community in Texas has ever known, nor has any community in Texas suffered from fire to an extent that is comparable to the Paris affliction. Taking into consideration the disparity of their sizes the Paris fire was relatively much greater than the Baltimore fire. There is less of Paris left than there was of Baltimore. The lowest estimate of the loss seems to be $10,000,000 and the highest $15,000,000, with the insurance probably not half the loss, whatever the total of it is. The insurance companies, it ought to be remarked, have already made arrangements to settle their losses with the utmost possible dispatch. They have waived, apparently, all of the prerogatives which, if asserted, would delay payment. If we count their loss at Paris as $5,000,000, and add to this their losses at Augusta, Ga. Nashville, Tenn., Tulsa and Hobart, Okla., and McKinney, the total, on the basis of popular estimates of the losses, run easily above ten million dollars, and this within a space of three days. Of course this loss will come out of the pockets of the people in the long run, but it will take a long time for the companies to reimburse themselves in that way.

Shingle Roof Properly Blamed

The shingle roof is blamed for the magnitude of this fire, and apparently with good reason. The shingle roof probably spreads a fire on a windy day about as well as could any contrivance which the ingenuity of man is capable of inventing. Once a shingle roof catches, every one of its shingles becomes a brand to carry the fire to other roofs. After thinking about it for a moment, one is apt to conclude that the remarkable thing about such conflagrations as this at Paris is that we have so few of them. Long dry spells and high winds are not uncommon with us, and this is a combination of elements that gives the possibility of a conflagration to the most insignificant of fires. The question of outlawing shingle roofs, that is, of forbidding the making of any more, ought to be taken up and acted on promptly. We are inclined to think that it ought to be done, both as a matter of justice and of expediency. The shingle roof makes the careful too much liable for the sins of the careless. Even if noncombustible roofing material does cost more originally, it will probably pay for itself before a great while.

What a Big Fire Teaches

(Houston [Texas] Chronicle.)

The sympathy of all serious-minded people goes out to the city of Paris in its hour of trouble.

Much of this sympathy will find expression in contributing relief, but being independent and self-reliant it is doubtful whether the good people of Paris want more assistance than that which is absolutely necessary for the immediate moment.

This attitude can hardly be characterized as one of resentment. Rather it should be called by a nobler name. The only men and women who are really worth while in the world are those who can take care of themselves, and want to.

Somehow we admire the man or woman who demands to do for himself, or herself, in the face of bitter emergency. This quality is just as essential to a normal, well-balanced character as is the spirit of giving.

Such accidents and calamities happen in the best regulated communities, but they shouldn't.

Man is perhaps the most improvident and thoughtless animal in the world.

He is long on curing his ills, but short on preventing them.

There are more men caught without firewood in the winter than there are squirrels without nuts.

Seldom does an eagle's nest blow away in a storm.

The wild goose never fails to fly southward in the fall.

Man, alone of all the animals, is careless and shiftless in safeguarding himself and those dependent upon him against disaster. Yet he is the most intelligent.

Fire insurance companies and fire departments are curative, not preventive.

There would be no use of carrying insurance if there weren't reasonable prospects of a fire.

There would be no use in maintaining a fire station if there weren't the probability of frequent blazes.

Now fire is largely under man's control. It isn't like death, or even the most common diseases.

A small percentage of fires originate from spontaneous combustion, or from apparently natural causes.

There is a place in Siberia where the ground frequently breaks into flame, and prairie fires, as well as forest fires, are sometimes caused by lightning.

As a general proposition it may be said, however, that the great majority of fires from which people suffer are due to carelessness, neglect and improvidence.

Neither is this carelessness, neglect and improvidence confined to the individual in his daily life and ordinary pursuits so much as to general custom.

We can hardly hope to build towns which are safe from fire, and which are immune from the necessity of maintaining fire departments and carrying heavy insurance at high rates, until we construct them more largely of non-combustible material.

Fireproof construction is very expensive, and sometimes very inconvenient, but taken by and large, it is probably the cheapest and most convenient kind of construction in the end.

The reason we haven't more fireproof construction comes about from an all too prevalent disposition to do things any way so long as they are done quickly.

We are all in a tremendous hurry. We want something quick, and since the cheapest thing is usually the quickest, we take the cheapest—that is the cheapest as measured by initial cost.

There are many towns in Europe a thousand years old, and some of them have never enjoyed the experience of a real good American burnout.

Of course the presence of forests and the availability of lumber are somewhat responsible for the way American towns have now and still are being built.

Had we exercised a litle more forethought, however, we should have perceived that we were not only endangering our towns by constructing them so largely of wood, but also that we were ruthlessly and wickedly wasting the lumber itself, to the great detriment of many vital resources.

In many sections of the country the capriciousness of the weather, the independability of crops, and the madcap fluctuation of rivers and streams, are largely attributable to the deforestation of neighboring regions.

Probably the time will never come when our towns and cities are so constructed as to do away with fire departments or the desirability of carrying fire insurance, but the expense in connection with both could be materially lessened were we to take those cautionary measures which are well known and obviously apparent to every intelligent person.

The record of this country so far as loss by fire is concerned is a terrible one.

City after city, town after town, and village after village have been swept away by flames, and in most instances these conflagrations might have been prevented had the cities, towns and villages been more careful and thoughtful in the matter of construction.

It is of no use to place a tinderbox where sparks are likely to fly and then try to play safe by providing a stream of water and a fire insurance policy.

If we spent half the energy and money in trying to prevent fires along rational and common-sense lines that we do in trying to provide compensation for the losses which they cause, or for checking them after they have once started, we should have accomplished material progress in the direction of real safety.

As it is, with the exception of our very largest cities, we have all the work to do over again. Most of our medium-sized towns, and about all of our villages must be built completely anew before we can regard them even as a good fire risk.

A Lesson for Every City

(*Savannah* [*Ga.*] *Morning News.*)

Savannah's sympathy goes out to Augusta, stricken last night by a most disastrous fire, and it need hardly be said that anything Savannah can do to serve the people of Augusta in their hour of trouble will be gladly done. The two cities have been such close friends for so many years, have contributed to each other's population for so long a time, and so many have been the ties between them, it is with particularly deep regret that Savannah people read this morning of the march of flames through the very heart of Augusta, destroying some of the finest buildings in the city—buildings of which it had cause to be proud.

Naturally it will be some time before the loss can be estimated with assurance of accuracy, but it is very great. The hope is expressed that stories of the loss of several lives are unfounded, and that Augusta may be spared this additional grief.

Augusta is a brave city. She has met misfortune with a stout heart in the past; and of course her heart is stout now, even in the presence of the blackened ruins of so fair a part of her business section. There will be rebuilding where now there are ruins and before long all signs of the fire will have disappeared. The destruction of the fine new office building of the Chronicle and the home of the Herald will not be permitted to interrupt for long the constructive work these newspapers are doing for their community.

It is a striking coincidence that Augusta, Nashville, Tenn., and Paris, Tex., cities widely separated, should have suffered from great fires almost at the same hour, the flames at Augusta and at Nashville, indeed, lighting the night at the same time. Each of the three cities was compelled to ask for help from its neighbors to fight the fire and in each instance aid was quickly sent.

Whether the cause of the fires was the same in all three cities may never be known, but it is certain that there was a lack of carefulness, a failure to take adequate precautions. Such fires should be a lesson to every American city, for none can be sure that its turn to suffer severely will not come next. While extending sympathy to each of the stricken cities, every city should look closer to its own efforts at fire prevention, its own precautions against fire.

Adopt Modern Construction Ideas

(*Nashville* [*Tenn.*] *Tennessean*)

The problem of rejuvenation and reconstruction confronting the citizens of East Nashville is a most difficult and, in fact, critical one, but the initial steps looking toward solution have been taken with an earnestness, promptness and intelligence that augurs well for the ultimate success of the gigantic task at hand.

If East Nashville, or that very considerable part of it now in ashes, is to be restored, it must be done along modern lines. Modern principles of construction must prevail to guarantee better protection against fire and better insurance rates, and civic and social improvements of modern demand must be provided. Former residents, no matter how long they have resided there, how material may be their property holdings or how great pride in their section and love for it, are not going to be held in line on sentiment, and unless ways and means are provided for a reconstructed section with every modern advantage and attraction there will be an exodus of many former residents to those sections where such conditions prevail and the movement projected an utter failure.

The initial meeting of property holders and others substantially interested, held at the Commercial Club Friday night, showed acumen in grasping the two main points involved in the movement, if it is to be made a success, and a commendable promptness in taking steps to bring about desired results. Unless the fire-retarding zone is extended to include the "shack" section, and before there is opportunity of rebuilding flimsy, insanitary and antiquated structures, there will be small, if any, chance of inducing the bulk of that substantial residential element that has given character and tone to the east side as a living section since the earliest days of the city, and who are yet anxious to live out their days there, to remain and rebuild.

It is hoped that the city commissioners will see fit to grant the request for an extension of the fire-retarding zone, and as promptly as possible, in order to forestall the possibility of any rebuilding calculated to foredoom the entire scheme in hand. This done, the forthcoming mass meeting to consider the providing for park space and possibly other modern civic improvements necessary to put through the second important step in the programme, will be in a position to successfully handle this phase of the matter, so dependent for its successful consideration upon the action of the commission in granting the desired extension of the fire-retarding zone.

The entire city is interested in the movement at hand, and every one should aid in every way possible toward its success. It is a movement inseparably connected with the movement for a Greater Nashville.

Educational Campaign Needed

(*Birmingham* [*Ala.*] *Age-Herald*)

Three Southern cities have suffered from disastrous fires within twenty-four hours and the sympathy of the whole South will be extended in unstinted measure. Paris, Tex., Nashville, Tenn., and Augusta, Ga., have had heavy financial loss from their conflagrations, though, according to late report, Augusta's loss threatens to be the most serious of all.

The fires in Nashville and Augusta will arouse keenest interest and sympathy in Birmingham because hundreds of residents of this city formerly lived in Nashville or Augusta or have family or business connections there. In Augusta it is the very heart of the business section that is bearing the brunt of the loss, but staggering blows have been dealt to three Southern communities.

These disasters will tend to arouse fire prevention sentiment still more strongly. Remarkable results have been achieved in Birmingam during the past year in fire prevention, so that the figures on fire losses are more and more encouraging.

The campaign of education has been carried on industriously and has been meeting with the most splendid co-operation.

And yet it is important to be always on the alert. Birmingham has felt in the past that her wide and spacious streets would protect her from great fires such as sometimes visit other cities, but a fire started in such a wind as raged in this city last night might cause a loss of millions of dollars.

Too much care cannot be taken in guarding against fire.

The Inflammable Roof a Crime

(*Nashville-Tennesseean*)

Aside from the high wind itself, there was no more noticeable feature in the spread of the East Nashville fire than the agency of burning shingles in setting fire to houses that would have otherwise escaped. It was no uncommon spectacle to see a burning shingle travel more than a quarter of a mile through the air and select as a terminal point the roof of another shingle-covered house. Had every house been compelled to be finished with any other roof than a wooden one, the fire would never have spread over any large territory, even with the fierce wind blowing. Not only fireproof structures, but even wooden houses should be required to provide a roof of some other material than the inflammable coverings used in so many of them.

The incorporation of such a provision in the building laws would immensely reduce the probability of houses catching from other burning houses, and would entail no hardship on the owners—being rather a blessing in that it makes security possible. Even shingles made as they were in the long ago, thick and substantial, become as dry as tinder with the passing of a generation; how much more the thin shingles in these days of wood scarcity, which dry out in a few months, or even weeks, to a point that makes the contact of a lighted match dangerous! In any conflagration these shingle roofs are the greatest spreaders of flame, and the one thing which no body of fire fighters can battle with. One burning shingle flying through the air, beyond the reach of the firemen, is a potent agency of destruction.

The fact that brick buildings went down as though they were of frame construction is no argument in favor of a shingle roof. It is an argument against wood roofs of any sort. In all probability nine-tenths of the fires in brick structures originated from burning shingles or other wood blown by the high wind. A burning shingle falling on a wood cornice or even a wood porch started a fire before it was discovered. There are plenty of substitutes for shingle roofs that are better and less dangerous—but there is not a single other roof that compares in danger with the shingles of the present day. And now is the time to take protective action.

The High Wind and the Combustible Roof

(*Dallas* [*Texas*] *Morning News*)

The few buildings left standing in the path of the Paris fire had non-combustible roofs, but many other buildings having the same kind of roofs were engulfed along with the hundreds having shingle roofs. Thus it is seen that a non-combustible roof gives no immunity to a building in a conflagration, but it is probably true that the chance of a conflagration such as that at Paris would be altogether negligible if there were no shingle roofs. It is the prevalence of shingle roofs which makes the conflagration possible, and once the conflagration begins, it extends to individual structures in the path of the flames when their roofs are made of combustible materials. Two conditions seem to be requisite for such a conflagration as that at Paris. One is a high wind, and the other a vast area of shingle roofs. The wind we can not command, but the other condition which makes the wind a fire menace is within our regulatory power. We can, by eliminating combustible roofs, eventually make such a conflagration as visited Paris practically impossible. When a fire in a residence section spreads beyond the block in which it starts, the flaming shingle is pretty certain to be the agent of communication. Rarely if ever do the flames leap the width of even the narrowest streets, and the sparks that sometimes ignite buildings at a distance would be harmless if there were no shingle roofs.

The reason that the use of shingles is still permitted without restriction outside the fire limits is that they are cheaper than any other kind of roofing practical for residences. But their cheapness is largely if not entirely in point of initial cost. One of our greatest extravagances is due to the lure of this spurious cheapness, to a failure to count any other than the initial cost. It is pretty certain that if the other costs were taken adequately into account, such as that of lesser desirability and greater insurance cost, it would be seen that shingles make at once the cheapest and the most uneconomical roofing. Hence there would be no real hardship in forbidding the use of shingles. But even if there were, the hardship might well be imposed as an obligation which the individual owes to the community. To be sure, it will be many years before a community can begin to derive any appreciable benefits from this precaution; but the fact is not an objection to the proposal, but rather an argument for action without further delay.

Proper Roofs Would Have Restricted Fire Zone

(*Nashville-Tennessean*)

A property loss of $2,000,000 in the fire of Wednesday is not a particularly great loss for a city like Nashville. It is not a blow that Nashville will really feel. The burned district will be rebuilt within a few months. By midsummer there will remain little visible evidence of the conflagration—except in the better type of houses that will have gone up.

It is merely a piece of good luck that the damage is not $20,000,000 instead of $2,000,000. The weather conditions were such that no fire could have been controlled; such that any fire would have burned its way to the open country. If the fire had broken out somewhere northwest, say in the region of Fisk University, the entire business section of Nashville, together with many of the largest manufacturing plants, would be in ruins. Had the wind been from the northeast instead of the northwest, the business section of the city and the residential districts lying west and south would have been swept away, for the flames would have leaped the river as easily as they crossed an alley. They did leap spaces as wide as the river.

So it is merely a matter of good luck that Nashville to-day is going forward without any serious injury to her industry or her commerce, and out of that good luck Nashville ought to learn a lesson. Unless the lesson is learned, the city is some day certain to burn to its foundation rocks.

That lesson is the elimination of fire hazards. What constitutes those hazards has been told so frequently and so recently that they need not be repeated here—except the two that appear to have figured most prominently in Wednesday's fire. Shingle roofs was the greater. Had all the houses been properly roofed, it is probable that the fire would never have crossed the railroad tracks; would have been confined within two or three blocks of comparatively cheap houses. Certainly it would have been checked before it reached the vast proportions that it did assume. The other hazard—the one that appears to be responsible for the beginning of the fire—is the leaving of inflammable materials in and about buildings. A pile of shavings in the yards of a lumber-working concern is said to have given the blaze the impetus that sent it roaring through more than a mile of buildings.

Those two hazards are, comparatively, easily avoided, the latter particularly so. Ordinary care is the only thing necessary. The former is not so easily removed, but the hand of official regulation can reach it more readily. It is certainly to be hoped that, under the new building code, shingle roofs will be tabooed, and the other roofs will be substituted as rapidly as possible for shingle roofs already on.

Rebuilding progress in the conflagration-swept centers will be detailed in following issues of CONSTRVCTION.

Kansas Fires During 1915

Property valued at $2,745,803 was destroyed by fire in Kansas last year, according to the newly issued annual report of State Fire Marshal L. I. Hussey.

Classified as to causes and respective losses, the record was as here given:

Cause.	No.	Loss.
Chimneys, flues, etc	265	$214.492
Electricity	40	162,177
Explosions	47	39.572
Exposure	156	256.721
Fireworks, balloons, etc.	10	4,403
Friction	2	25.055
Gas	31	22,055
Hot ashes and coals	10	470
Hot grease, oil, hot or molten metal	8	1.735
Incendiarism	130	214.654
Lightning, buildings rodded	3	3.750
Lightning, buildings not rodded	199	202,685
Matches	149	62,356
Miscellaneous	42	26,188
Open fires	12	1,275
Open lights	10	2.291
Petroleum and its products	141	75.615
Rubbish and litter	65	8,644
Smoking	49	23.973
Sparks, from combustion	258	77.734
Sparks, from running machinery	4	174
Spontaneous combustion	86	109.319
Steam and hot-water pipes	2	1.005
Stoves, furnaces and their pipes	119	143.485
Unknown	607	1.065.975
Total	2.445	$2.745.803

PREVENTABLE CAUSES

Commenting upon the principal fire causes, Marshal Hussey says:

"In Kansas the annual fire loss as reported to this office runs on an average well over three million dollars a year. If to this be added the operating expenses of the insurance companies in the State, and the burden of maintaining fire departments, the cost to the State will approximate ten million dollars a year.

Most of this can be saved by the exercise of reasonable care. For instance, more than one-fourth of the loss in Kansas last year, where the cause was known, can be traced to defective heating apparatus, including chimneys and flues, or to carelessness with good apparatus.

"Every one of these fires was preventable, of course.

"Take the case of lightning. Fires from this cause destroyed over $200,000 worth of property in Kansas in 1915. Practically all of this could have been saved. In the nearly three years of its existence not a single case of fire caused by lightning has been reported to this office where the building damaged was properly rodded. The experience of other States has been practically identical with that of Kansas. The universal installation of approved lightning rods on all farm buildings would go a long way toward eliminating lightning as a cause of fire. City property is seldom damaged by lightning, possibly on account of trees, trolley and telephone wires and other objects that, after a fashion, take the place of rods.

"The subject of lightning suggests that of commercial electricity. Bad wiring and its kindred defects caused fires during the year that destroyed property worth $162,000. Ordinary care in wiring and the handling of wires, fixtures and other equipment would remove almost entirely the electric hazard.

"Incendiarism caused 130 fires in 1915, with a loss of $214,000. While it is the insurance companies that are defrauded directly out of this amount, the honest policyholder eventually pays the bill. Nearly all of these fires will be prevented when public sentiment awakens and demands the punishment of incendiaries the same as other criminals.

"Other causes than those mentioned show a similar proportion of preventable fires, so that it may safely be said that an overwhelming majority of all fires are unquestionably avoidable.

Another Fire in the Edison Plant

For the third time within two years fire occurred in the extensive plant of the Edison Company at Orange, N. J., on the 21st ultimo. The property damage fortunately did not exceed $3,000, the fire being confined to two small frame structures used as storage houses. That it did not spread to the large factory building immediately across the street is attributed to the use of wire-glass windows set in steel frames in the latter structure. To quote from a local news report of the recent fire: "One of the deductions made, as a result of the 1914 fire [where the loss was nearly $5,000,000], by Mr. Edison and his chief engineer, Miller Reese Hutchinson, was that if the buildings had had steel window frames and wire glass, the flames would never have spread as they did. This proved true last night."

Following the sweeping fire of 1914, Mr. Edison and his engineers conducted a series of tests of wire glass, with the result that the product was later ordered installed in the chief buildings throughout the plant.

The Editor's Page

IN the busy hours of every day
We pause—
To analyze and weigh
A striking word, or deed, or
thought.

Wooden Shingles—The Principal Element in Conflagrations

Nashville, Tenn.; Augusta, Ga.; Paris, Tex.! A staggering fire loss of approximately $20,000,000 in three conflagrations which occurred almost simultaneously!

To those who face disaster and ruin, whose prosperous businesses and comfortable homes are gone forever after the quick passing of these conflagrations, we extend our heartfelt sympathy—and their loss extends beyond themselves throughout the entire economic and social scheme of national existence.

Uncontrolled fire, *given paths along which to travel*, is the greatest single agent of destruction known to mankind!

Only last month, under the heading "The Shame of Augusta, Ga.," we quoted on this page the Augusta *Chronicle* of March 7, 1916, "Shingle Roofs Win Victory in Council." The "victory" referred to was the success which attended an organized effort on the part of the lumber interests to have the limits in which wood shingles could be used extended in the city of Augusta.

Our editorial constituted a criticism of the short-sighted policy which would not only *allow* the use of the wood-shingle roof in any part of the city; but would extend the corporate limits in which this criminally dangerous roof covering could be used; and, further, emphasized the "need of efficient organization on the part of manufacturers of incombustible roofing materials" to oppose the efforts of the lumber interests by bringing *facts* and *undistorted statistics* before the officials on whose shoulders rests the grave responsibility of formulating and enforcing building laws and codes which, above all things, should guarantee *safety* to life and property!

On the editor's desk today lies the issue of the same paper for March 24, 1916—a newspaper of but four small pages now—because of the destruction of the offices in the great conflagration; a newspaper small in size perhaps, but great in that it voices the living spirit of Augusta—a spirit of resignation to great losses, combined with an optimistic determination of rebuilding for better things! Again we quote, but this time the attitude of criticism has been transformed into that of encouragement and sound advice—"Stopping Only to Banish Distress, Citizens Start in to Rebuild a Greater Augusta."

What an indictment of criminal construction! What a complete reply to the claims of those who advocate the use of the wood-shingle roof—to those who were responsible for its use in the devastated cities! What a lesson to the cities of America!

The pen falters and longs for a super-language in which to express the emotions which are aroused at this time. If we could only bring into the minds of the citizens of this country—the builders, the home-owners, the city officials, a few simple truths in connection with this matter of great avoidable fire losses—if we could only center attention on the behavior of fire-resistive materials in these conflagrations as compared to that of wood—if only those who are about to build, and those who make the laws and building codes for our communities, would investigate this matter of the dangerous use of wood in building construction and, realizing, *act* against the kindling wood covering of homes—the providing of paths along which flames may travel—the principal element in the great chemical reaction we call a conflagration—*the dangerous wood-shingle roof!*

But one question and one answer are needed to convince any thinking man of the actuality of this danger. Is the shingle roof allowed in any section of this country which has within the last few years been visited by a serious conflagration? No! Salem, Chelsea, Jacksonville, Patterson, Bangor, will testify to this reply, and now—Nashville, Augusta and Paris?

To the sister cities of the South, and to the cities of America who have not read the warning so plainly written in letters of flame and smoke—will you sit blindly waiting in the shadow of the menace of the criminally dangerous wood-shingle roof until the lesson is *burned in*—or will you turn *now* to your law-makers and say: "To the building code of this city shall be added:

"Every building hereafter erected within the corporate limits shall have an *incombustible* roof covering; and no existing wooden shingle roof, if damaged more than 25 per cent, shall be renewed or repaired with other than *incombustible roof coverings*"?

The time has come when the American public must realize that we can no longer be a nation of wood-builders. True, it is a habit ingrained by generations of use since the days of pioneering; but natural evolution and development has brought about changed conditions; our villages have become great cities; our timberlands are fast disappearing; and the products of the earth—clay, stone, steel, asbestos—are being used as never before to replace inflammable wood with incombustible time-defying materials.

I Am the Wooden Shingle

By Robert T. Gebler.

I am the WOODEN SHINGLE!

Ruin—Death and Tears upon my pathways move.
He who puts me on his home for protection, I betray.
I have a soul of FIRE—I glory in ruin!
Each flying spark sets me upon some fresh-hatched lust.

When I am new I am attractive, but treachery lingers in
my beauty—my greatest admirers I turn to scorn.
Those who boost me most I crumple with ridicule.
And those who use me to shelter loved ones place
at their throats my fingers of fire.

Hissing ruins sing my symphony—for at best I am but
a fickle friend. I am a thief in the night—I hate
beauty—I am an enemy of all things useful. Security
irritates me and I crush those most who fear me least.

I am the WOODEN SHINGLE!

For a brief spell I am fair to look upon.
But scorching suns soon rot out my vitality—I split and
splinter and soften like the weakling that I am.
Winter freezes tear my vitals—I am a mark for drenching rains.

I tear at my moorings—a discontent—I warp with fiendish
glee—I let in the rains and the weather, and ALWAYS I crave for sparks. I thrive on flying brands!
I am worn out before my usefulness begins—a decrepit in
my youth—a coward—a sneak—one of nature's misfits.

And mark ye—I shall steal from those that trust me. I
shall betray them to fire as long as they depend upon
me for protection.
I shall rob them of their homes—I shall come like a
plague in the night and murder and plunder and destroy. I hate those that love me.
My record is black with ruin and red with blood. And
yet ye fools—ye trust me again and again!
It is to laugh—

I am the WOODEN SHINGLE!

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THE LARGEST CONCRETE MIXERS EVER BUILT

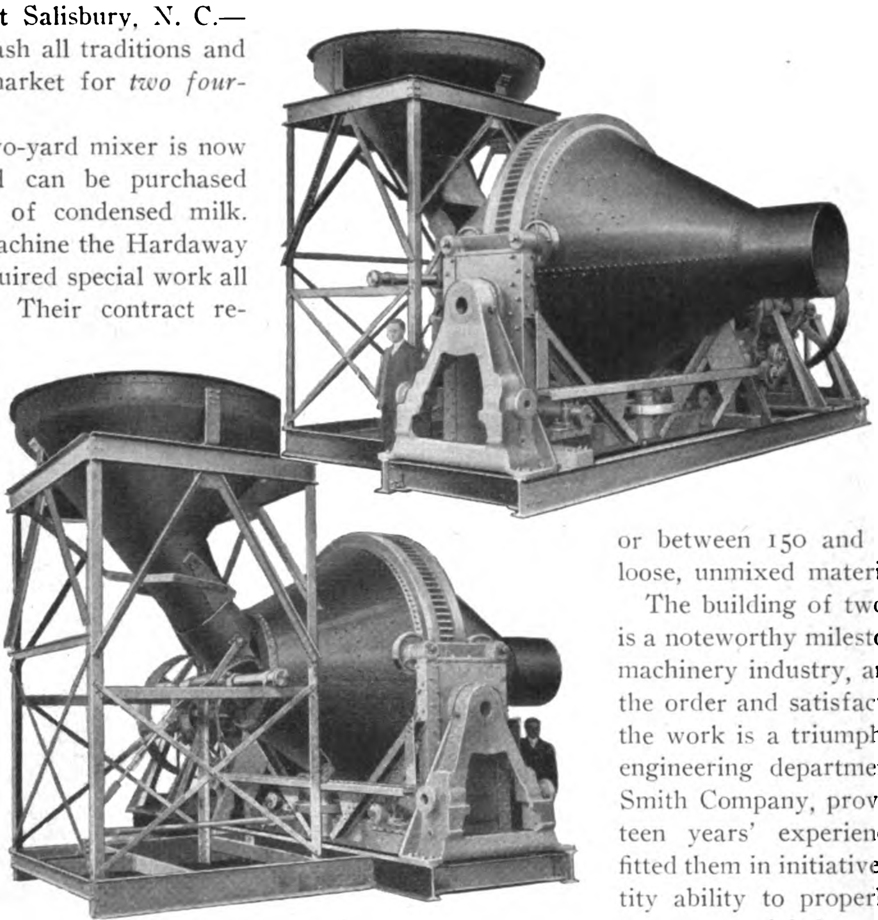
Two Record Breaking Monsters Throw Out 108 Cubic Feet of Mixed Concrete Per Batch

NOT so many years ago a two-yard concrete mixer was considered as an enormous machine. Now the big construction companies think nothing of ordering two-yard mixers, and, as is ever the case with progress, one of them—The Hardaway Contracting Company of Washington, D. C., which recently took a contract for an immense concrete dam to be built at Salisbury, N. C.—determined to smash all traditions and go out into the market for *two four-yard machines.*

The common two-yard mixer is now a stock affair and can be purchased much like a can of condensed milk. But the sort of machine the Hardaway people wanted required special work all the way through. Their contract required them to pour 60,000 cubic yards a month until the job was completed which meant a total of 1,000,000 cubic yards. On looking over the ground they found that four two-yard mixers would take up too much lateral space. It became necessary for them to use two four-yard mixers.

After showing the specifications to several manufacturers who could not undertake the work, not being in a position to construct such unheard-of mammoths, a call was made on The T. L. Smith Company of Milwaukee, Wis., where they were informed that the job could be done in a way which would result in machines which would take care of the tremendous capacity The Hardaway Company desired.

The T. L. Smith Company received the unique order without any competition.



To build the *two biggest mixers in the world* is a job to take just pride in. These machines are twice the size of any mixers used in the construction of the Panama Canal. Each monster is mounted on steel skids, with an enormous batch hopper supported by a steel frame. The mixer itself is equipped with power tilt and further equipped with Allis-Chalmers clutch pulley. The weight of the two machines totals 92,000 pounds. The the drum ring is made of ⅜-inch steel. The inside diameter of the drum ring is 9 feet 6 inches. Each machine has a capacity of 108 cubic feet of mixed concrete per batch, or between 150 and 160 cubic feet of loose, unmixed material.

The building of two four-yard mixers is a noteworthy milestone in the concrete machinery industry, and the securing of the order and satisfactory completion of the work is a triumph for the sales and engineering departments of The T. L. Smith Company, proving that their sixteen years' experience has eminently fitted them in initiative, quality and quantity ability to properly meet any ordinary or special demand of modern construction practice when it comes to concrete machinery. Engineers and contractors throughout the country will be interested in this unique accomplishment.

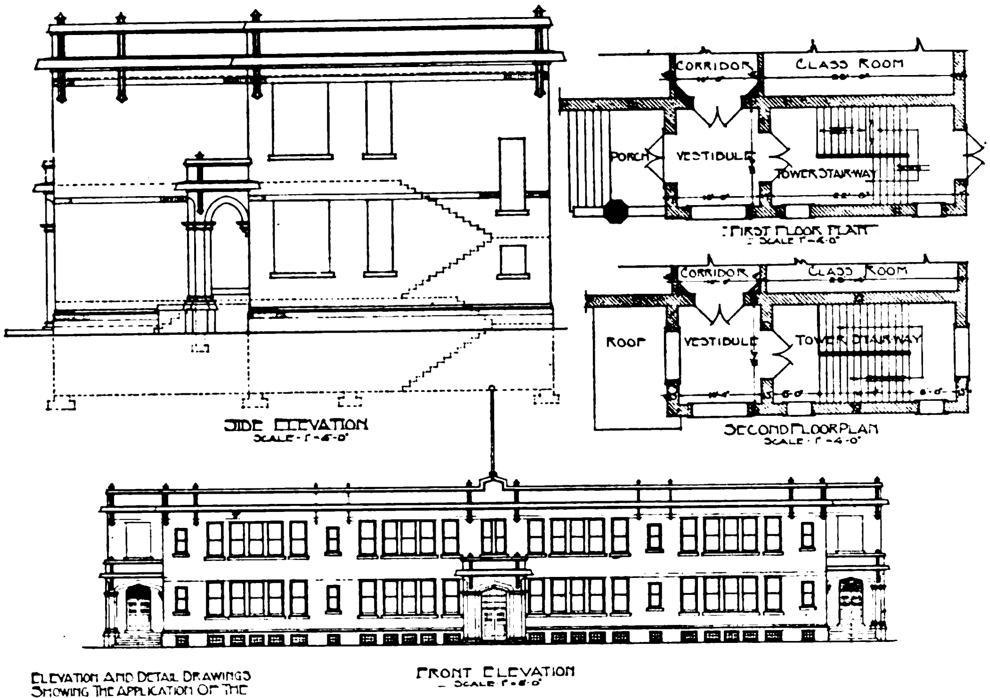
Masons of Fort Worth, Texas., are agitating the erection of a central temple in their city; the proposed edifice to cost from $200,000 to $500,000, according to the measure of support given the general idea. The committee in charge of the matter is composed of William James (chairman), Sam Davidson, A. L. Schuman, Ben Keith, C. W. Harkrieler and C. W. Connery.

Better and Safer School Buildings

By James R. Young

Insurance Commissioner of North Carolina

FOR several years the loss of school buildings by fires has been unusually heavy. This liability to burn carries with it not only the loss of property, but the loss of lives of the inmates—teachers and scholars. The reason for this is, no doubt, found in the character of the buildings being erected and has evoked the description—"Built-to-Burn."



ELEVATION AND DETAIL DRAWINGS SHOWING THE APPLICATION OF THE DOUBLE TOWER STAIRWAYS IN AN ELEMENTARY AND HIGH SCHOOL BUILDING AS RECOMMENDED BY JAS. R. YOUNG INSURANCE COMMISSIONER.

My duties under our building and fire-escape laws, and the fact that for the last twelve years we have in North Carolina erected on an average over one school building a day, impels me to offer the following suggestions to Boards of Education and others concerned in safeguarding our schoolhouses against the menace of fire and its attendant peril—panic.

The law of North Carolina requires that the Insurance Commissioner, who is *ex-officio* fire marshal, to see that school buildings, as well as other buildings in which the people assemble, shall be provided with sufficient exits to render them safe in case of fire. This is a most important and necessary duty, and means very much, especially for the safety of the children in our schools. Children are the most helpless ones in case of fires and their attendant panics, and yet less attention is paid to the safety of school buildings than any other class of buildings in this State and throughout the whole country. Some one has said "They are built to burn."

Burnings

From time to time—alas! too frequently—the people are startled and horrified at the destruction of some school building and the awful death of many of its inmates. So far, these horrors have occurred in other States, but the appeal to our people is to arouse them before a like disaster occurs in our midst. We boast of having erected a school building a day for the last twelve years in North Carolina, and yet a large majority of our best buildings are of the class the burning of which has caused the most frequent and greatest loss of lives.

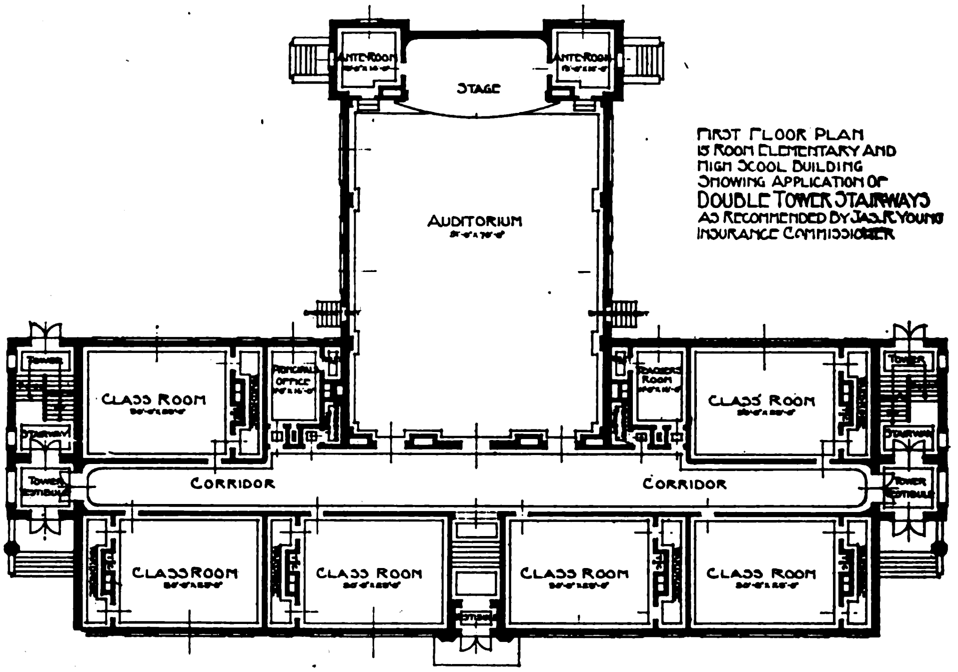
Safe Buildings

It will pay us in the end to erect a better class of school buildings. The frame building over one and, at most, two stories should go. The brick and wood hollow wall construction building, though the type most largely built as our better class of school buildings, should go. The building should be of mill construction fitted up with automatic sprinklers or of reinforced concrete or other unburnable material. The difference in the cost of repairs, insurance, etc., will make up the extra cost of building in a few years.

Our school committee men and officials may persuade themselves that they cannot erect buildings of the better type, but can they refuse or fail to make them safe? It can be done in the erection of new buildings at no additional cost and, for buildings already erected, certainly at no greater expenditure than is more than justified by the safety afforded, the guarding against the awful loss of life to the children of the State by school fires.

Dangers

The two great dangers in school and many other fires are the rapidly spreading fire and the "smoke panic." Cut out the smoke filling the building and provide for conditions that will prevent the fire from spreading rapidly, and every child can be saved without loss of life or even damage. Of course, the better the class of building the slower it will burn; but some plan is needed to bring about these conditions where the better class of building cannot be erected or where the more dangerous class is already erected and in use.



Remedy

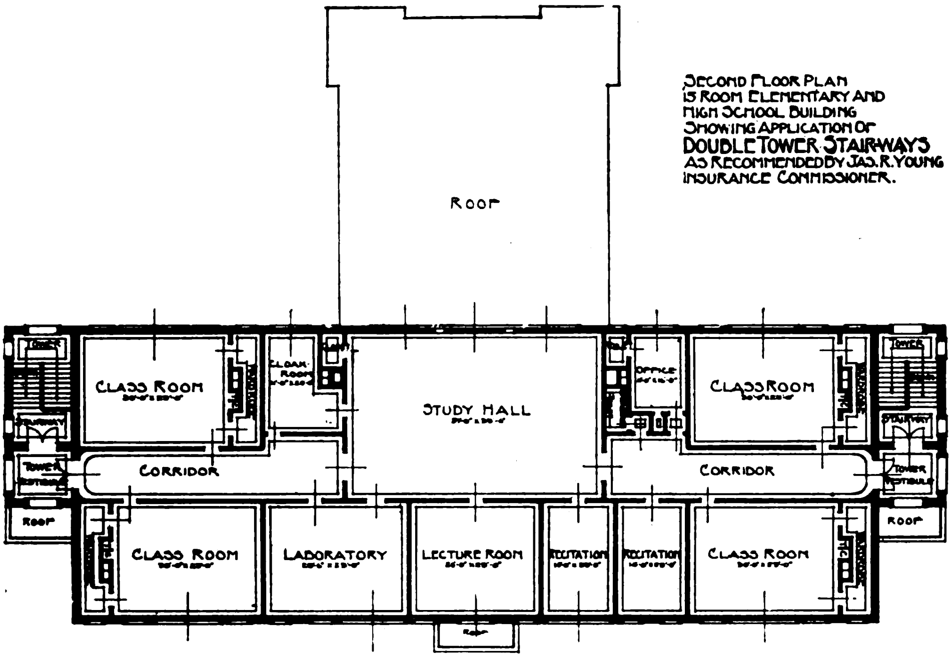
This can be done by closing all openings between the different floors and, where the building is of hollow construction, putting stops in the walls at each floor, and at least once between floors. The place of stairways or means of communication from one floor to another can be supplied by "double tower stairways" outside the main walls of the building. They are cut off from the building, but enclosed and furnish two partitions—one for the platform and the other for the steps or stairways. No smoke can reach from one floor to another nor, under this plan, even fill the stairways and cause a smoke panic—the horror of all school fires and the main cause of the casualties.

Your attention is called to the cuts showing the first floor, second floor, front elevation and the floor plan and elevation of the double tower stairway. The size of this tower and its cost depend, of course, upon the size of the building, but in all cases it can be built practically for the cost of the inside stairway, made possible by the saving of space in the building anl its cost. With these double tower stairways the buildings are rendered safe and the cost of fire escapes saved, none being necessary.

Referring to the pamphlet, "Better and Safer School Buildings in this State," issued from this department, I desire to make additional statements; and furnish the cuts herein, believing they will bring out more clearly and emphasize the suggestions therein.

1. The question of *better school buildings* is, of course, dependent upon the views of those who have charge of their erection as to their desirability as well as upon the amount of funds at their command for use in their buildings. The statements in the pamphlet referred to show conclusively that it will be cheaper in the end to erect school buildings of a better class, to say nothing of their safety. The difference in the cost will be overcome in a few years by the smaller depreciation and less call for repairs on the building, as well as the saving in insurance premiums.

2. The question of *safer school buildings* is of very



Second Floor Plan
15 Room Elementary and
High School Building
Showing Application of
Double Tower Stairways
As Recommended by Jas. R. Young
Insurance Commissioner.

great importance and one that cannot be overlooked, if our school authorities are to come up to the full measure of their duty in safeguarding the children committed to them. There are two divisions of the work: (1) the erection of safe buildings, and the other (2) the making of such changes in the buildings already erected and in use, as will render them safe for occupancy. The erection of safer buildings will, of course, only come up as new buildings are proposed, but the making of the present buildings safe faces us each day and calls for prompt action in every city, town and school district of the State.

3. The use of "double tower stairways" is practicable not only in the erection of new buildings, but in making our present buildings safe. In my opinion it is imperative that the school authorities throughout the State shall immediately examine their buildings and make them safe. This can be done at small cost by cutting out all stairways and openings between the different floors and the erection of tower stairways modeled after the plan of the tower fire escape.

4. It is worthy of consideration, and I desire to bring it to the attention of the school authorities, that the "double tower stairways" can be attached not only to brick buildings and make them safe for the children on the upper floors, but also to frame buildings and make them absolutely safe for the children on the second floor. The reason for this is they do away with the "smoke panic," as well as the "rapidly spreading fire," by cutting out all inside stairways and openings between the different floors.

5. That the use of tower stairways does not add to but lessens the cost of school buildings is an additional reason for their use.

* * *

Firesafe School Buildings in Massachusetts

APPRECIATING the lessons taught by the Peabody horror of some months ago, when twenty-eight innocent young lives were lost through the swift burning of a school building, the Fire Prevention Commission of Boston has prepared a well-considered measure, the adoption and enforcement of which by the Massachusetts Legislature would make all school buildings in the State—if not immune from the fire hazard, at least measurably safe.

As the bill, consideration of which has been referred to the next general court, contains much that might with profit be employed in other Commonwealths, we reproduce it in its entirety herewith:

Section 1. The term "schoolhouse," when used in this act, shall include all buildings used wholly or mainly for instruction as public or private schools, admitting pupils of primary, grammar or high-school grades or their equivalent.

Sec. 2. The requirements herein set forth shall be put into effect before the first day of September nineteen hundred and seventeen: provided, however, that the judge of the probate court for the county in which any schoolhouse is situated may, on the application of the municipality, person, or corporation having the control of such schoolhouse, approve other plans or materials that will in his opinion adequately safeguard the lives of the children in said schoolhouse.

Shutting off Heating Apparatus

Sec. 3. In schoolhouses not exceeding one story in height and containing more than one school-room, if the heating apparatus be located in the basement, the ceiling of the basement, if constructed of combustible material, shall be protected with metal lath and cement plaster at least three-quarters of an inch in thickness, or its equivalent; all spaces under walls and partitions and over girders, around heat and vent pipes, and around stairways, shall be thoroughly firestopped with brick in mortar, or its equivalent; and self-closing fire doors shall be installed at the top or bottom of each stairway leading from the basement to the floor above. No provision in this act shall be construed to apply to portable schoolhouses.

Sec. 4. In schoolhouses that exceed one story in height the said basement shall be cut off from the floor above in the following manner: the ceilings, underside of stairways and landings, if constructed of combustible material, shall be covered with metal lath and cement plaster, at least three-quarters of an inch in thickness, or its equivalent; all spaces under walls and partitions and over girders, around heat and vent pipes, and around stairways, shall be thoroughly firestopped with brick in mortar, or its equivalent; and self-closing fire doors shall be installed at the top or bottom of each stairway leading from the basement to the floor above.

Automatic Sprinklers Required

Sec. 5. In school houses exceeding one story in height, if not of fireproof construction, where there are stairs or stairways connecting the first floor with the basement, the entire basement and all rooms above the basement used for manual training or laboratories shall be equipped with automatic sprinklers, either wet or dry system, provided with an adequate and constant water supply, and installed in accordance with the standard regulations adopted by the district police. Such sprinkler system shall be adequately protected against freezing, and shall be kept in commission and under pressure whenever the building is occupied for school purposes. Where basements are equipped with automatic sprinklers, as provided in this section, the self-closing doors for basement stairways, as provided in sections 3 and 4, need not be fire doors.

Wooden Partitions Barred

Sec. 6. In schoolhouses containing more than one room, partitions of wooden sheathing shall not be allowed in the basement, unless they be covered with metal lath and cement plaster, or its equivalent; and if heating apparatus be located in a basement that is not of fireproof construction such apparatus shall be separated from other parts of the basement by fireproof partitions, the openings in which shall be equipped with self-closing fire doors.

Sec. 7. In all schoolhouses, corridors leading to two or more exits shall be divided by a cross-partition equipped with self-closing double swinging doors.

Sec. 8. Rooms situated in the attic shall not be used for class-room purposes unless such rooms open on adequately lighted corridors that have two free and widely separated stairways leading to the exits from the building.

Building Inspectors Must Enforce Law

Sec. 9. In the city of Boston it shall be the duty of the building commissioner and in other parts of the Commonwealth it shall be the duty of the building inspection department of the district police to enforce the provisions of this act.

Sec. 10. If any city or town, or any official or officials in any city or town, whose duty it is to appropriate money for the construction of schoolhouses or to authorize such construction, or any person or corporation having control of a private school, refuses or unreasonably neglects to carry out the provisions of this act, or such order as a judge of a probate court may issue in lieu of the provisions of this act, such city or town, such official or officials, or such person or corporation, upon information presented by the building commissioner in the city of Boston, and by the chief of the district police in other parts of the Commonwealth, shall be liable to a fine not exceeding one thousand dollars. It shall be the duty of said building commissioner and of said chief of the district police to present information in such cases.

Sec. 11. The requirements of this act shall apply also to all schoolhouses hereafter erected, if not of fireproof construction.

Providing Funds

Sec. 12. Cities and towns may incur debt, within the limit of indebtedness prescribed by chapter seven hundred and nineteen of the acts of the year nineteen hundred and thirteen, and payable within ten years, for the purpose of making alterations in schoolhouses already constructed, so as to comply with the provisions of this act.

Protecting Interior Stairways

Official notice has been given by the State Industrial Commission of New York of the adoption of the subjoined rule, affecting the construction of all factory buildings, five stories or less in height, erected prior to October 1, 1913, in which there are more than twenty-five persons employed above the second floor.

"All interior stairways, serving as required means of exit, and the landings, platforms and passageways connected therewith, shall be enclosed on all sides by partitions of fire-resisting material extending continuously from the lowest point of the stairway in accordance gith the following schedule:

Number of Stories.	Contents Combustible, No Sprinkler	Contents Noncombustible, No Sprinkler	Contents Combustible and Sprinkler	Contents Noncombustible and Sprinkler
Three..............	Stairways enclosed			
Four..............	Stairways enclosed	Stairways enclosed		
Five..............	Stairways enclosed	Stairways enclosed	Stairways enclosed	

"The term 'contents' as used above means articles, goods, wares and merchandise, packed, stored, manufactured or in the process of manufacture.

"The term 'combustible' as used above means articles, goods, wares or merchandise which will burn or support combustion.

"The term 'sprinkler' as used above means an adequate automatic sprinkler equipment installed and maintained in good working order on each floor.

"Where the stairway extends to the top floor of the building, such partitions shall extend to three feet above the roof, except in buildings with roofs of non-combustible material, in which case the partitions may stop at the under side of the roof.

"All openings in such partitions shall be provided with self-closing doors constructed of fire-resisting material, except where such openings are in the exterior wall of the building.

"The bottom of the enclosure shall be of fireproof material at least four inches thick, unless the partition extends to the cellar botton.

"Such enclosure of stairways shall not be required where there is an interior enclosed fireproof stairway, or where there is an exterior enclosed fireproof stairway."

Protected by Wire Glass

A dust spark in a wooden conveyor is held responsible for the complete destruction by fire of the extensive Newark (N. J.) plant of the Lister Chemical Company on March 25 last. The loss is placed at $100,000. In its account of the fire a local daily paper paid this high tribute to the fire-retardant properties of wire-glass windows:

"So fierce was the heat that for a time it was feared the plant of the Textileather Company nearby would become ignited. The plant is a brick structure and its windows are of wire glass and to this the firemen ascribe the fact that it was saved."

Wichita County, Tex., is to have a $225,000 courthouse, plans for which have been approved. Bids, it is expected, will be asked for about May 1. The structure is to be three stories and a basement in height. Gray marble, brick and terra cotta will be the building material principally used.

Slipping and Tripping: A Most Serious Public and Industrial Hazard

By H. Weaver Mowery, Safety Engineer

OF vital interest to architects and all others concerned with construction or maintenance of buildings are some extracts from an address delivered by Mr. H. Weaver Mowery, Safety Engineer, New York City, at a meeting of the Philadelphia local of the National Safety Council, held recently at Franklin Institute.

Through records from industrial commissions of four States and the Coroner's Office of New York City he showed that an amazing number of casualties and an enormous cost for compensation, hospital and medical expenses, etc., are chargeable to the use of unsafe surfaces on which people walk or work. As the types of materials used are determined largely by the architect and the engineer, they can and should co-operate in the effort to eliminate most of the unsafe material conditions which permit these needless casualties and expenses.

"More casualties than from any other public industrial hazard are caused by slipping and tripping. And yet less effort has been directed toward the elimination of this type of hazard than has been given to each of several others which, combined, are less productive of casualties.

CASUALTIES FROM VARIOUS HAZARDS.

(Compared with those from "Slipping and Tripping.")

	Massachusetts (*a*)	New York (*b*)	Pennsylvania (*c*)	Ohio (*d*)	Totals
Ladders	827	675	304	(*x*)	1,806
Planers and Joints	352	361	(*x*)	533	1,246
Belts and Pulleys	894	1,022 (*e*)	235 (*e*)	467	2,618
Cranes	317	408	818 (*f*)	917	2,460
Gears	1,103	637	124	(*x*)	1,864
Elevators	382 (*g*)	378	118	(*x*)	878
Total	3,875	3,481	1,599	1,917	10,872 (*h*)
Slipping and Tripping	2,245	1,838	3,421	3,495	11,099 (*i*)

(*a*) Year ending June 30, 1913.
(*b*) Year ending December 31, 1912.
(*c*) Year ending December 31, 1914.
(*d*) Year ending June 30, 1915.
(*e*) Also includes shafting, coupling and set screws.
(*f*) Includes all accidents in connection with overhead cranes, shocks, burns, struck by and handling material.
(*g*) Figure given by Mass. Ind. Accident B'd. (1066), included 522 miscellaneous; 30 struck by falling object, 77 falling down shaft, 45 caught in machinery and 13 caught by fire hatch or trap.
(*h*) Includes many casualties of which sliiping or tripping was the promoting cause.
(*i*) Does not include slipping and tripping casualties included under other headings.
(*x*) Figures not available.

"These records are no doubt fairly accurate. But many casualties having slipping and tripping as their promoting cause are frequently classified under other headings. If a person working around power-driven machinery slips and gets caught, losing a finger or his life, the casualty often is classified wrongly as 'from unguarded machinery.' Out of seventy-four cases of gear accidents reported to one insurance company, five were caused through slipping or falling into gears. Casualties classed as elevator accidents are in many cases caused by slipping on the metal door sills or other slippery surfaces at floor landings. If all the casualties whose promoting cause is slipping or tripping were subtracted from the classes in which they are erroneously recorded and added to their own kind, the necessity for active co-operation toward eliminating slipping and tripping hazards would be even more apparent.

The severity of the casualties from slipping and tripping were shown by the following tables:

FATALITIES IN NEW YORK CITY (MANHATTAN)

FROM FALLS ON STAIRS AND SIDEWALKS—SLIPPING, TRIPPING, ETC.

Year	1912	1913	1914	1915	Total (4 years)
Number	164	163	170	128 (*a*)	625

(*a*) Owing to an active campaign against sidewalk hazards there was a reduction from 68 sidewalk casualties in 1914 to 35 in 1915.

CASUALTIES RESULTING FATALLY IN NEW YORK CITY (MHN.)

INVESTIGATED BY CORONER'S OFFICE.

CLASS.	1914	1915
Automobiles	178	191
Falls on Stairs and Sidewalks	170	128
Conflagration	65	26
Stove, Lamps, Bonfires	91	56
Elevators	50	47
Horse-drawn vehicles	95	57
Surface Cars	54	41
Subway Trains	13	22
Elevated Railroad	12	16
Not classified	0	24
Total	728	608

"In the four years just past there were 625 recorded fatalities in Manhattan from slipping and tripping. In 1914 and 1915 there was from this source a total of 298, while there were only 283 from elevators, fires and surface cars combined.

"The actual amount in dollars and cents awarded as compensation, hospital and medical expenses, etc., reported by the Industrial Commissions of Ohio shows that slipping and tripping are much more expensive than any one of four other typical hazards.

AMOUNTS AWARDED FOR SOME CLASSES OF CASUALTIES

THE INDUSTRIAL COMMISSION OF OHIO.
(Year ending June 30, 1915.)

CAUSE	NUMBER	AMOUNT
Slipping, stumbling and falling on stairs, floors, etc.	3,595	$152,986.45
Cranes	917	88,329.00
Belts and pulleys	417	36,662.34
Planers and jointers	333	33,640.56
Saws	1,088	66,552.00

Why Such Accidents Occur

"The causes of slipping and tripping are unsafe material conditions."

In a certain large New York office building there was an average of nearly four accidents per week for a long period, caused while people were getting on and off elevator cars. Many people would blame such accidents on the carelessness of the injured. Many of us have gotten on and off elevators thousands of times without injury and it may seem that carelessness might be blamed for the injuries that do occur. But in this particular case the superintendent of the building finally was induced to install, at all floor landings, a strip of anti-slip material about eighteen inches wide along the entire bank of elevators. Since then there has not been a single reported fall. The uneven stopping at floor levels, speed and volume of the traffic remain approximately the same except for slight increase in the volume. Material conditions were made safe and now the people get on and off the elevator cars without injury.

To show clearly and place beyond doubt the fact that slipping and tripping casualties are not caused by carelessness but by unsafe material conditions and that they can be eliminated by proper effort, I will give another example that has come to my attention.

On the main stairway of the Pennsylvania Railroad Terminal in Philadelphia there were twenty-one accidents in six weeks. At the North Philadelphia Station of the same railroad there was an average of two reported falls per day on certain stairs for a period of two months. No doubt many statisticians would have claimed that these casualties were caused by the carelessness of the injured. However, the safety experts of the Pennsylvania Railroad reached different conclusions, and with favorable results. Absence of handrails, poor lighting, improper tread and riser dimensions, absence of nosing overhand and other purely mechanical defects are some of the causes of stair accidents. But the principal immediate or promoting cause is in unsafe treads. In this case the steps were equipped with a type of tread having a smooth metal nosing edge and heel-catching grooves or depressions. Observation showed that people descending the stairs would slip on the metal nosing edge, the foot would slide forward and the front of the heel would catch in one of the grooves, throwing the person forward, frequently striking upon the head. Those treads were then replaced by another type having anti-slip nosing and no heel-catching grooves. At once the accidents ceased, and during the time observations were continued, in the following three months, not a single fall was reported. It should be noted that other conditions, including lighting, traffic conditions, etc., remained the same, but the change in treads from an unsafe to a safe type eliminated the danger to the pedestrian unable subconsciously to discern clearly which one of the lines extending in the same direction was the line of the step edge, and more important still, it removed the promoting cause of accidents—the slippery, nosing edge and heel-catching depressions. From 141 accidents in two months to none in three months by the use of safe treads is conclusive evidence of the possibility of eliminating slipping and tripping casualties and that material conditions can be made so safe that people may pursue their normal activities without abnormal care.

Especially in original design and specifications many hazards could be prevented by a few pencil strokes. When drawings are being made and when the specifications are being written is the time to think of safety and provide safeguards wherever needed. Such provision at this period is a measure of economy. A company employing a large amount of dangerous power-driven machinery recently expended $4,500 to reduce certain hazards and undesirable conditions which would have cost them less than one-third as much if these matters had been considered in original specification and construction. Such unpleasant and expensive experience may be obviated and the interests of safety better served through a strict adherence to carefully prepared and explicit specifications.

During actual construction, rigid inspection should be made to provide for safe material conditions as well as the quality of workmanship and material entering into the project. Many things that are not apparent to the designer are discernible as the work progresses. It is much easier and more economical to remedy unsafe conditions as they are discovered than after the structure is completed. Moreover, operating conditions during construction may be made more safe. Loose, broken and uneven sidewalks, scaolding and walkways in the work itself, and material dangerously piled should not be permitted.

Some Legal Safe-guards

In New York State, the Labor Law, in Sec. 79-A-3, requires that in all factories over one story in height the "stair treads shall be so constructed and maintained that persons walking thereon shall not slip." Within the past few months the same provision has been embodied in the New York City Building Code. Pennsylvaniia, on February 1, this year, adopted an amendment to Safety Standard, Vol. 1, No. 13, which pertains to foundries, and is as follows:

"All passage ways and stairways, inclined runways, charging decks and platforms shall be properly lighted and shall have tread surfaces so constructed and maintained that persons walking thereon will not slip or trip." The National Fire Protection Association has embodied the same provision in its specifications for standard buildings. Other important bodies are awakening to the urgency of insisting that slippery surfaces shall be eliminated and that instead of slippery stone, glass, cement and especially iron and steel there shall be used some effective anti-slip material.

Inefficient Tread Material

What constitutes an effective anti-slip material is a question I shall refrain from discussing. But there are a few matters in this connection which are so important I feel they should be called to your attention.

Rubber matting, because of its insulating qualities, is especially useful around high tension electrical apparatus; but it cannot be considered satisfactory for universal application as an anti-slip surface, since it is decidedly slippery when covered with oil, soapy water, etc. For many purposes it is too expensive, especially in this era of high prices, and not sufficiently durable to be considered generally.

Cork tiling, bitumen or asphaltum mastics, maganesite cement, rough finish granolithic and similar surfaces all have their proper uses wherein they are satisfactory.

But polished surfaces or hard wood, metal, stone, glass, etc., should not be permitted where people are constantly passing or where workmen are occupied. When such surfaces are oily or even moist, the danger of slipping is extreme. All tread surfaces of cast iron or steel are incipient or virulent slipping hazards. Corrugations or other irregularities in the surface design of cast iron or steel do not make an effective anti-slip material.

* * *

Mercantile Buildings at Elizabeth, N. J.

While the State laws "are good and well enforced," the local ordinances governing building operations at Elizabeth, N. J., in the opinion of the engineers of the National Board of Fire Underwriters, "are inadequate."

"Because of weak construction" in the city's mercantile district, "serious group fires are probable, but owing to the mainly adequate fire-fighting facilities, low heights and small areas, streets of fair width and good accessibility, no sweeping fire should occur."

A new Cambridge, Mass., ordinance provides for building inspection.

Abolish Fire Marshal in Maryland

A determined effort to secure the defeat of the measure providing for the abolishment of the fire marshalship of Maryland is being made by the insurance men. While the office has been in existence for a comparatively brief time it has very materially reduced the number of suspicious fires in the State, and underwriters contend that its abolishment at this time would result in an increase of at least 25 per cent in the loss ratio.

Providence to Have New Theatre

An addition to the playhouses of Providence, R. I., will be erected by the Emery Amusement Company of the city. The new structure, to be located on the corner of Washington, Empire and Aborn streets, will be of white matt glazed terra-cotta with colored ornamental work. The interior finish of the theater will be of Italian and Egyptian marble, with ornamental plaster bronze and tapestry. The building, according to its owners, is to be "absolutely fireproof."

William R. Walker & Son, of Providence, are the architects, and William Williams, of the same city, the general contractor.

Fear Danger at Rochester

How the business men of Rochester, N. Y., regard the combustible-roof hazard may be inferred from the following statement by W. M. Angle, chairman of the fire prevention committee of the Rochester Chamber of Commerce: "A city having a large proportion of combustible roofs faces a very great conflagration hazard. With this fact in mind the committee made a careful study of the comparative cost of non-combustible and combustible roof materials, and decided that, considering all the factors, the gravity of the conflagration hazard warranted an earnest effort to have all new roofs constructed of non-combustible materials. The committee's efforts during the last six months of its existence have been bent towards this end, and the movement is gaining ground."

Fire Loss at Tampa in 1915

Last year 315 fires occurred at Tampa, Fla., involving property valued at $1,624,990, upon which the loss was $178,022.63, with insurance paid of $170,886.13.

SAFE HOTEL CONSTRUCTION

MAY ISSUE

Influence of Romanesque and Byzantine Periods Upon Modern Architecture

By Prof. W. W. Watkin, Instructor in Architecture, Rice Institute

LECTURING recently before the students of the Rice Institute of Houston, Tex., upon "Some Houses of Historic Architecture Expressed in the Buildings of the Institute," Professor Watkins, dwelling especially upon the influence of the Romanesque and Byzantine periods, said in part:

"We found that there had existed in Italy an architecture decidedly distinct from the character of the architecture of Greece. We found that the architecture of Italy had from the earliest times been one in which the use of the round arch had been of the essential nature of its construction; an architecture in which the gradual expanding possibilities of archuated construction had continued in Roman work up to the marvelous developments of the buildings of the late Roman Empire. It was natural, therefore, that Italian architecture, in the ages succeeding the fall of Rome, should cling closely to forms associated with the round arch in its humbler expression, by virtue of the fact that its means were more modest and its limitations much more complete than those of Rome in the days of its prosperity, the resulting architecture showing less of the extensive development of archuated construction in great vaulted interiors, but continuing its expression of round-arched windows and round-arched doorways and simple-arched interiors with wooden roofs.

"In the institute you feel constantly in the buildings the degree to which the design in pattern of marble and brickwork has been used, but for the most part this pattern work is on the exterior. As yet, however, the nature of the rooms has been that of classroom or laboratory, rooms in which the decorative styles have not been called for. In the course of time, as occasion develops, and as there is opportunity in these buildings in which the decoration of the interior may be carried to its logical proportion as compared with the stylistic treatment of the exterior, we naturally look forward to the giving both color and detail the true character which shall reflect the colorful possibilities suggested in the interior treatments of marble and the interior treatments in murals and fresco which accompanied the work of the early Christian architecture in Italy.

Use of the Triple Arches

"I wish I had time allowed me to go on at greater length relating to the use of triple arches and the great relieving arch enclosing the tympanum over triple arches which was to such large extent used in Italy and Dalmatia. This motif was one of the principal features of the style, and it occurs in the buildings of the institute in the pleasing form of three slender windows separated by columns supporting the arches over the heads of the windows, and they in turn separating a decorative panel made up of brickwork and marble, which is in turn inclosed by a strong brick relieving arch made up of a succession of forms, and more vitally of a succession of shallows, the charm of which was appreciated in all periods of the Italian renaissance, and which was used to a very beautiful extent even as late as the buildings of Genoa.

"Treatments in plaster, reflections of which, although simplified to be true in their Romanesque character, occur in various forms in the dormitory groups, the domestic character of which was obtained in the stucco which was generally used in the domestic architecture of the Italian buildings.

"The Lombard influence continued in Italy with the creation of still more extensive monuments, such as the Church of St. Zemo, in which you see a breaking away from the purely Roman forms and the adoption of certain newer forms in which there are latent architectural possibilities before finally its completion as a style in Italy leads us to such an exterior as that of the churches of Sienna and Pisa, in which there have been developed influences markedly beyond the earlier Lombard beginnings, and dating in the eleventh century, at which time, frankly, the possibilities of the style have been exhausted or at least have been diverted to expressions which no longer possess the structural dignity of the earlier Romanesque.

More Beautiful Details Chosen

"Therefore, you can see that it is impossible for me to place before you a composite prototype of the buildings which you see about you here at the institute. However, I simply try to outline how clearly the various characteristics fall within the period of the purely

Italian Romanesque and how we have tried to continue the richer and more dignified qualities of that style, choosing as an inspiration the more beautiful details developed in various and successive periods from the fourth to the tenth centuries A. D., trying, however, to avoid the influences which you see beginning in such a church as these later Romanesque churches of Northern Italy, and also to avoid the later influences of a similar nature, but more attractive in their presentation, occurring in the city of Venice, all of which influences we must see are the beginnings of that style which a century later had developed into the so-called gothic, and in which the more clearly Roman characteristics had been reduced to a minimum and a different conception of archuated construction had been achieved by the builders of Northern Europe. Italy, however, as you know, never embraced the gothic. For Italy the gothic style was but a temporary influence which was unfortunate and unsuccessful, a fact that was perfectly natural in that it had been developed to its greatness under climatic conditions totally different and totally separated from those of Italy.

"I would recall to you, therefore, that we have up to this time found that the architecture of the institute is in nearly all of its parts Italian in its character; that for the most part its expressions are of the periods of the Romanesque in Italy as existing between the fourth and the tenth centuries; that there is in it the influences which are purely Roman and the influences of the Byzantine as they were exhibited in Roman work in Italy in such monuments as those of Ravenna; that there is also to a minor extent the occurrence of the even later influence of the Lombards; but that beyond this point we have sought to exclude from our designs anything that would reflect an architecture which to us appeared to have lost its vital touch with the round arch which was the essence of its design."

"Fireproof Building" Put to the Test

A striking example of the value of a consistently planned "fireproof" building was afforded some days ago when fire broke out in the seven-story structure of the American Express Company, 219-227 East Forty-second street, New York city.

Originating in the battery room and garage of the building, the flames severely damaged twenty electric and gasoline motor trucks. To quote from a daily paper: "Battalion Chief Martin, who was in command of the firemen, 'telephoned for extra engines and other apparatus when told that there were 400 horses stabled on the second, third and fourth floors of the big structure. But when he found that the building was practically fireproof and that little of the smoke penetrated the upper floors, he decided the animals could safely remain.' The fire, which did not go above the basement, where the brick-arched ceilings and walls confined it like a furnace, resulted in slight damage to fixtures and plastered parts of the walls and ceilings."

Had the building, instead of being consistently fireproof, been of the ordinary type of mercantile construction, it is easily imaginable that not only would the several hundred horses in the upper floors have been lost, but that the lives of the employees as well might have been seriously threatened.

As it was, however, thanks to intelligent planning and construction, very little smoke from the fiercely blazing grade floor fire "penetrated the upper stories." A concrete example such as the above offers an unanswerable argument in favor of firesafe building.

Insurance Rates in Arkansas

Because of recent unusual losses in the South, J. S. Speed, general manager of the Arkansas Actuarial Bureau, predicts a general increase in present fire insurance rates for the territory. Mr. Speed says:

"One thing is certain, the insurance companies are going to need money, and the evident increase of the fire hazard is going to mean an increase in fire insurance rates. This will affect dwellings as well as other buildings, particularly in the South, because of the prevalence of shingle roofs. It has been demonstrated that rates on dwellings are not adequate in the South, though they are higher than in the North and East. Compress and cotton rates are bound to go up by next season, and it is not unreasonable to expect a general increase in rates throughout the country."

May Sue Railroad

There is a possibility that the insurance companies may attempt to hold the Texas and Pacific Railroad responsible for the damage done at Paris, upon the ground that the fire started on its property.

Statement of Ownership, etc.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, of CONSTRVCTION, published monthly at New York, N. Y., for April 1, 1916.

State of New York, County of New York, ss.:

Before me, a Commissioner of Deeds in and for the State and county aforesaid, personally appeared George A. Watson, who, having been duly sworn according to law, deposes and says that he is the general manager of CONSTRVCTION, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Constrvction Publishing Co., Inc., 1475 Broadway, New York City.

Editor—C. Stanley Taylor, 1475 Broadway, New York City.

Managing Editor—C. Stanley Taylor, 1475 Broadway, New York City.

Business Managers—A. H. Eichholz and G. A. Watson, 1475 Broadway, New York City.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock): Constrvction Publishing Co., 1475 Broadway, New York; G. A. Watson, Cranford, N. J.; C. Stanley Taylor, 1475 Broadway, New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

GEORGE A. WATSON, General Manager.

Sworn to and subscribed before me this 3d day of April, 1916.

[Seal] WILLIAM E. WERNER.

(My commission expires October 20, 1916.)

Eliminating Special Hazards

By IRA G. HOAGLAND

Secretary, National Automatic Sprinkler Association

"THEORETICALLY speaking," said R. M. Bissell, insurance companies pure and simple have nothing to do with the prevention of extinguishment of fires or with the reduction of the fire waste. Their province is merely to distribute the losses which fires cause. Despite this truth, it was a short-sighted business policy which prevented the stock companies from actively co-operating with factory owners, especially with cotton and woolen manufacturers, who, when the burning ratio, and hence the cost of indemnity, had risen to an unbearable extent, sought so to improve their property as to reduce the number and amount of losses, and so indirectly the cost of insurance. It seems to be true, however, that the failure or absence of such co-operation was largely responsible for the origin of this class of factory mutual companies, whose methods as first practiced by themselves, later by the stock companies, have fairly revolutionized methods of protection against fire and made possible greatly reduced rates for risks of all classes when properly protected. The first of these companies was organized in 1835.

From the outset these companies have endeavored, first, to ascertain and eliminate the causes of fires; and, second, to provide such ample protection that any fire which might occur should be extinguished with but slight loss."

In spite of the lesson of the cotton industry, there followed that of the pulp industry. The pulp men started out with no more idea of segregation of hazards and fire control than did the cotton manufacturers. The plants burned so fast that the stock companies wouldn't write them. The pulp men went to the mutuals and learned about segregation of hazards and fire control. To-day standard pulp mills equipped with automatic sprinklers are being written by stock companies at dwelling-house rates.

But when the boot and shoe manufacturers got "up against it" and sought relief from the heavy burden the frequent burning of their factories was imposing upon them, the stock companies were ready to help them. Forward-looking men among the New England special agents had organized a factory-improvement committee. The committee sat down with the distressed manufacturers and a way was found to modify the application of the insurance law of probabilities to boot and shoe factories.

Ever since the pioneer enterprise of the far-sighted fire insurance field men in New England in forming a factory-improvement committee to find ways and means of immunizing special hazards to the law of probabilities, stock fire insurance companies have been doing their part in the general endeavor to get the "able" out of the probable in that fateful law.

At first inspection bureaus were organized by the few progressive companies which began a new era of underwriting in anticipating the law of probabilities instead of following it. These bureaus established direct relations between insurers and insurees through the medium of engineers whose duty it was to advise the subscribing companies how best to forestall and the insured how best to improve conditions to escape the law. After the inspection bureaus came the stock company underwriting associations, which make and take their own advice and pay up, when infrequent losses occur—so well do they anticipate the decree of likelihood—from the funds collected for the subscribing companies. Some of these organizations are similar in character and functions to those established by mutual insurance companies.

* * * * * * * *

At the time acetylene entered the arts the Underwriters' Laboratories were ready to guide the ideas of those who sought to make the vehicles of application, the gas machines, and so forth, into safe channels. The work done by these laboratories in electricity and acetylene alone has conserved many millions of dollars of the wealth of this country.

Other laboratories have performed similar service in their special ways, notably those of the factory mutual fire insurance companies in Boston. Also in Boston an insurance engineering experiment station was established, where valuable research work was done, work that has contributed much to the knowledge of how to anticipate the law of probabilities. Then there is that valuable anticipatory work that is being done by the engineers of the National Board of Fire Underwroters' fire prevention committee in relation to city conflagration hazards.

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Schedule Rating Adopted

In order that rates might be consistently proportioned to the effort made to modify the probability of fire, the system of schedule rating was established. This method of rating has influenced characteristic forms of special classes of hazards. The modern theater is the result of it. Schedule rating developed the standard cottonseed oil mill and the modern fertilizer plant in the South. It has encouraged better construction, treatment of hazards and countless other things, and all of this affects the law of probabilities and volume of premium necessary to "hedge" the bets or cover the risk.

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Underwriters want knowledge of special hazards which will enable them to commit their companies to risks with a full understanding of the conditions involved. Nowadays this is obtained largely through the agency of inspection bureau reports. These reports have been standardized in form and arrangement of topics, but that does not always insure a report of a nature that will be of the best service to the underwriter. A concentrated essence of the facts of a risk in a topical summary enables an underwriter to quickly picture the risk in his mind's eye and, brief though it is, the summary is where the inspector can put forth his individuality, weigh the worth of the facts, and express opinions of them. But the opinions should not confound the facts, which should always be accurately presented. Sometimes inspectors and underwriters do not agree as to the influence of certain things in a risk, and when there is a difference of opinion the unalloyed facts are particularly useful to the underwriter.

The Special Hazard Rate

The premium rate is now a good index of the risk of a special hazard. R. M. Bissell says: "In the last analysis the basis for the rate on any risk must be largely determined by the hazard inherent in risks of the class to which it belongs. The different processes and dangerous material are, in the case of special hazards, conspicuous and their hazards comparatively obvious, hence their appraisal or estimate may be the more easily made."

But to some underwriters the rate is not an index of the risk. One of them said, in commenting on the sufficiency of a rate on a special hazard, that it would burn just as easily at 5 per cent as at 2 per cent. To be sure, it might "burn," but that the 5 per cent risk would be as likely to burn as the 2 per cent risk would be rather a far-fetched contention.

Why Special Hazards Burn

"The chief reason why so many special hazards burn," says F. C. Moore in "Fire Insurance and How to Build," "is the want of foresight on the part of manufacturers, and of oversight on the part of underwriters, in not securely separating from the great bulk of property exposed to a fire those dangerous processes which might easily and at small cost be entirely isolated. It is too frequently the case that a dry kiln, for example, involving a value of only a few hundred dollars, is unnecessarily so located as to inevitably burn the entire plant when it could be isolated so as to burn without a loss greater than the value of its own contents. Agents should aim to have risks subdivided in this manner to insure greater safety and lower rates for the larger values. Where rates are intelligently made, the owner is sometimes handicapped for the entire life of the structure with a higher rate charge on the entire value at risk, when he might have been called upon to pay it only on a small amount of specific insurance in the limited area of danger.

"It should be the business of underwriters to suggest and enforce these improvements by discriminating rates. When special hazards are constructed with reference to the rules of prudence and common sense, each establishment being divided into two or more distinct risks, the more dangerous portions, such as dry-rooms, paint-rooms, picker-rooms, boiler-rooms, oil storage-rooms, etc., being completely isolated, so that their burning will not endanger the larger values, we may expect to see planing-mills and other dangerous specials insured at rates which their owners can better afford to pay, but which will at the same time yield a profit instead of a loss to the insurance companies themselves.

"It is possible, by the judicious division of even the most dangerous risks, to confine a fire to a comparatively small value and thus materially to improve them. A very large percentage of almost every manufacturing risk involves no greater hazard than that of a storage warehouse, and might be insured at warehouse rates but for unnecessary and inexcusable exposure of large values to dangerous processes. The owner who subjects the whole of his property to the consequences of a single accident has no one but himself to blame if the underwriter who insures his risk points out the danger and charges, on the whole value at risk, the proper rate due to the most hazardous portion."

In concluding this chapter of the subject it may not be out of place to call attention to the slogan of P. B. Armstrong, which aptly epitomizes the formula for present-day successful underwriting of special hazards: "Inspection; Selection, Protection."

But above all the conditions in the insurance business that the special hazard has inspired is this: that it has given us the insurance engineer. I am not prompted to say this because I am an humble member of the fraternity, but because the insurance engineer is the most important cog in the insurance wheel to-day. It is he who is doing things to that law of probability. The insurance engineer is to-day an indispensable factor in the affairs of a fire insurance company.

Exit the Special Hazard

I have pointed out how the special hazard has transformed the insurance business, and now I wish to speak of the transformation or, I might say, the elimination of the special hazard by the automatic sprinkler. The thought of attempting this reminded me of a young man at college who never lost an opportunity in debates to drag in Patrick Henry. The fellows got somewhat tired of the everlasting discussion about Patrick Henry, and so they made up their minds that there was only one thing to do, and that was to find a subject that Patrick could not be brought into. So they called a meeting, and, after a long and arduous discussion, they finally decided upon this question: "Can a horse be cured of the colic?" The night came around and our friend was sitting in one of the front seats all prepared. The chairman called the meeting to order, and this particular debater proceeded to diagnose a case of colic in the horse. After pursuing this subject for many minutes he finally came to the point where he felt that he was called upon to close his remarks, which he did in these words: "And, gentlemen, in the last analysis, what is a case of colic within the horse? Why, it is nothing less than generated gas within the bowels of the animal pursuing its way to what may be described, in the words of the immortal Patrick Henry, 'Give me liberty or give me death!'"

The special hazard, because of what it made necessary in fire prevention, has modified the application of the law of probabilities and automatic sprinkler protection has eliminated the special hazard.

Insurance experts say that automatic sprinklers reduce to a common level, firewise, the special features of construction and occupancy of various classes of insured properties.

What better evidence of this is there than the following-named classes in which automatic sprinklers have controlled 100 out of 100 fires during the 18-year period, 1897-1915, taken from the annual summary of statistics compiled by the National Fire Protection Association and published in the association's "Quarterly"?

Bolt and screw works, brush factories, candle factories, coffee and spice mills, cold storage plants, cotton ginneries, distilleries, linen mills, forge shops, harness and leather works, straw hat factories, incandescent lamp works, insulated wire works, junk shops, lead-pencil factories, linseed-oil works, motion-picture theaters, oil clothing factories, oil refineries, plumbers' supplies stocks, restaurants, rubber cloth factories, shirt factories, sugar refineries and waste paper and rag shops.

Assuredly a widely dissimilar aggregation of industries ranging from cold, hard bolts and screws to that notorious generator of spontaneous ignition—linseed oil; from cold storage to plain junk, and from waste paper and rags to sugar and spice. But in all of them fire finished in a monotonously similar fashion under automatic sprinklers. Even distilleries were rendered immune to the "sulphur-and-brimstone" hazard.

But a better idea of how sprinkler protection has eliminated the special hazard will be gained by reviewing briefly a bit of history. The establishment of the mutual system of insurance has been remarked, which was done to pry loose the special hazard from the law of probability. The mutual system started about 1835, and under the conditions then existing made progress, but in the late '70s it began to languish. Mills were increasing in size and values and hazards multiplying. These conditions progressed beyond the control of customary measures of fire prevention and the foundation of "mutual insurance" promised to become undermined.

Scientific Fire Prevention

"Automatic sprinklers were known, but had secured little or no attention," said Edward Atkinson, in commenting on this period of instability. In 1875 the first practical sprinkler was devised and several mills in Fall River, Mass., were equipped with the device during the same year. Other individual manufacturers followed suit, but it was not until 1880 that the mutual fire insurance companies recognized automatic sprinklers. In his book, "The Prevention of Loss by Fire," Edward Atkinson, at that time president of the Boston Manufacturers' Mutual Fire Insurance Company, says:

"In 1880, what may be called the science of preventing loss by fire was fairly entered upon, and at that date measures were taken, after careful consultation with the very few manufacturers who had at their own motion put in the automatic sprinklers for the extension of that service, which has now become practically universal. Without their support and the confidence due to their practical experience, the writer would have had much more difficulty in promoting the adoption of sprinklers, as some of his own insurance associates were skeptical, and two were positively opposed to them. But the writer had become convinced that, unless the hazard of larger and larger factories, higher speed, etc., could be met, the mutual system would break down; and he then told his associates that automatic sprinklers must be made a condition, cost what it might."

And what better illustration of the fact that automatic sprinklers have eliminated special hazards is there than the special hazard underwriting experience of one insurance company whose business in this respect increased 7,000 per cent and the loss ratio decreased 84 per cent?

Ozanum Council, Knights of Columbus, intends the erection of a substantial building at Cambridge, Mass., in the spring. The structure is to be three stories in height, according to plans drawn by Matthew Sullivan of Boston. The building material to be chiefly used will be brick with stone trimmings.

A new fire-alarm system costing $25,000 has been installed at Cambridge, Mass.

BUILDING LAWS AND ORDINANCES

Fort Worth, Texas, Acts Promptly

After a study of the Paris fire and the conditions that made possible such severe and widespread loss, "Mayor Tyra and Fire Chief Bideker, of Fort Worth, Tex., decided to recommend to the council of their city the adoption of an ordinance prohibiting the use of wood shingles for roofing purposes. This, in the opinion of the officials named, would make wellnigh impossible a widespread conflagration in the city. Chief Bideker stated that substantial roofing material could be obtained that would cost but little more than wood shingles."

Amarillo to be on Guard

AMARILLO, TEX., March 24.—Alarmed by the experience of Paris, the Amarillo Board of City Development held a meeting this evening to discuss more adequate insurance for every building in the city. Movement was also set on foot to inspire all citizens, property owners and otherwise to use their efforts to prevent fires. Fire Chief Banks Jones stated that the method of disposing of trash is the greatest single menace to the safety of the city. He also urged that all buildings be roofed with fireproof roofing.

Fire Safety Zone at Canton, Ohio

That Canton, Ohio, now has a defined zone within which the erection of wooden buildings is barred, is due in large measure to the intelligent and active interest taken in the matter by the Chamber of Commerce of that city.

Watching Meridian, Miss.

Insurance men are greatly concerned over the loss record of Meridian, Miss., and attribute it in large degree to the repeal of the anti-wood shingle ordinance adopted upon the recommendation of the fire department chief.

Progress at West Hoboken, N. J.

With the model code of the National Board of Fire Underwriters as a basis, a new building code is being prepared for West Hoboken, N. J. Prominent among the features to be required under its provisions is the fire-proofing of all iron and steel girders used in buildings over a certain height. Owners of factory properties will be compelled to file with the building inspector the carrying capacity of each floor and the nature of the material used in their construction.

Preparation of the code is in the hands of Building Inspector Charles Birda, Architect Frederick Weir, Fire Chief Frederick Scheer and Councilman F. Adrian.

Duluth to Have New Code

Appreciating that the building code now in operation at Duluth, Minn., is decidedly antiquated, the Mayor of the city, under direction of the Common Council, has arranged for its revision. A special committee has been named for the task, and its members are now securing useful data. Duluth—the Zenith City—has had a remarkable and thoroughly justified growth, and its further steady development may be confidently predicted.

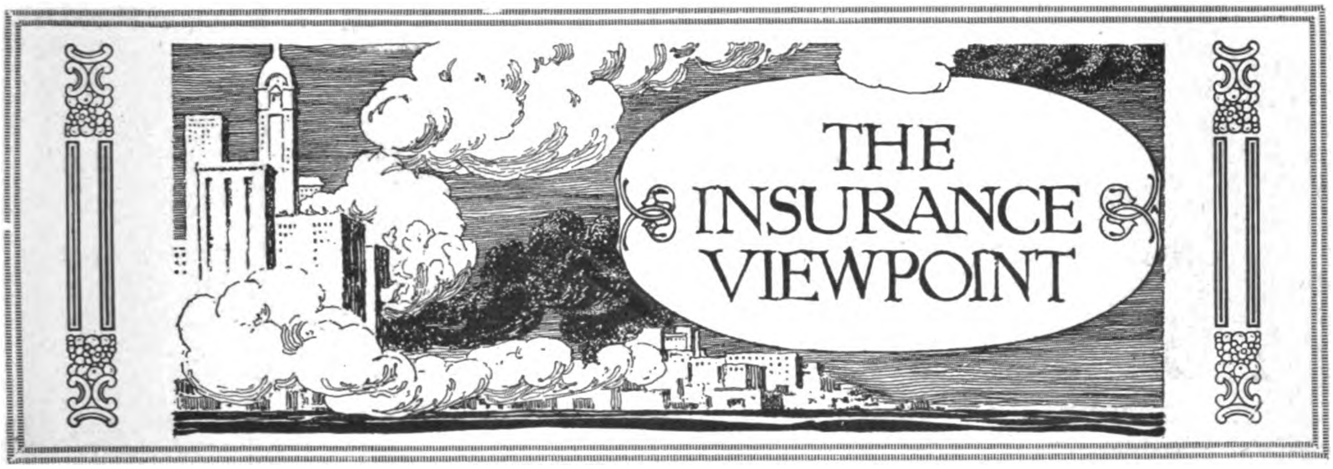
It is intended that the new building code shall serve as a proper guide to city construction, with an especial view to its safety from the fire menace.

Cranston, R. I., Needs Code

Cranston, a thriving manufacturing center in Rhode Island, is without a building code, and its daily paper is insisting that one be adopted forthwith.

Electric Wiring Requirement at Louisville

On and after May 1, Building Inspector Williiam J. O'Sullivan, of Louisville, Ky., will require that all electric wiring be enclosed in metal tubes.



Must Inspect Properties

A bill to regulate fire insurance rate-making for the District of Columbia is now before Congress, and a determined effort, it is reported, will be made to secure its enactment into law.

The measure provides in effect that "No fire insurance company, or other insurer against the risk of fire or lightning, nor any rating bureau, shall fix or charge any rate for fire insurance upon property in the District of Columbia which discriminates unfairly between risks in the application of like charges and credits, or which discriminate unfairly between risks of essentially the same hazards and having substantially the same degree of protection against fire."

It further commands: "That every rating bureau engaged in making rates or estimates for rates * * * shall inspect every risk specifically rated by it upon schedule and make a written survey of such risk, which shall be filed as a permanent record in the office of such bureau. A copy of such survey shall be furnished to the owner upon request."

Under the operation of such a measure as that presented above, every penalty charged for a defect in construction is clearly pointed out, and its removal by the assured would automatically reduce his premium. Underwriters are ready and anxious at all times to advise with prospective builders, their architects or engineers, regarding the proper planning of stuctures, especially from a firesafe standpoint, appreciating that every properly constructed building is not only a good individual insurance risk, but serves as a retardant in the event of serious neighboring fires.

Better Dwelling Rates for Wisconsin

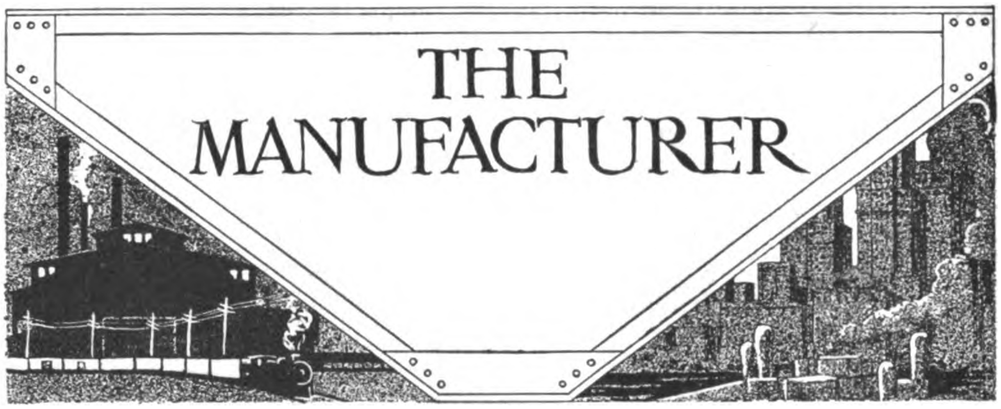
Within a short time, it is understood, the Rating Bureau for Wisconsin will promulgate a new series for rates covering dwelling properties throughout the State.

Interesting Fire Statistics

An interesting tabulation recently prepared by Fire Prevention Commissioner John A. O'Keefe, of Boston, gives the number of fire alarms per population in each of the twenty-six cities and towns embraced in the Metropolitan Fire Prevention District during 1915:

The standing of the communities on the list, Commissioner O'Keefe says, "gives the relative safety of inhabitants from fire, but is no indication of the efficiency of the Fire Department. It gives, further, the indication that cities and towns at the bottom of the list have the prevailing conditions that lead to fires, such as the accumulation of waste material, especially oily rags and refuse subject to spontaneous combustion; the habit of using dangerous matches instead of the strike-on-box matches, which are cheaper; careless smoking; the presence of combustible material near gas jets; the careless use of candles, kerosene lamps and stoves; defective chimneys and flues, and the **use of wooden shingles.**"

	Number of Fire Alarms	Number Per Population	Relative Standing
Arlington	107	5.98	4
Belmont	53	5.46	3
Boston	5,542	6.20	7
Brookline	312	7.75	11
Cambridge	709	5.48	2
Chelsea	533	10.20	20
Everett	291	6.43	8
Lexington	140	21.00	26
Lynn	1,061	9.23	15
Malden	399	6.80	9
Medford	426	11.60	22
Melrose	203	10.00	18
Milton	148	14.30	23
Newton	747	14.40	24
Quincy	493	10.10	19
Reading	125	15.30	25
Revere	302	10.00	17
Rockland	44	5.18	1
Saugus	105	8.54	13
Somerville	633	6.07	5
Stoneham	55	6.12	6
Waltham	299	8.27	12
Watertown	148	7.47	10
Winchester	117	9.75	16
Winthrop	158	10.30	21
Woburn	172	8.75	14
Total	13,322		



THE MANUFACTURER

¶ Co-operation is sounding a new note of progress across the vast fields of American industry.

¶ Here is a great undeveloped market for your product.

"—They is Organized!"

DID you ever hear the story of the colored stage driver who was so skilled in the use of his long, lashed whip that he could pick the bees off the thistles as he drove along the road?

It's not new, but it has a lesson for the manufacturer of fire-resisting building materials.

Everybody who rode with Uncle Joe marveled at his skill in handling his whip. As he drove along the road he would say to his passengers:

"See that bumble-bee suckin' the honey outer dat thistle over yonder?"

"Crack," went the lash of the whip, and the bee dropped to the ground.

One June day a New York traveling man rode beside Uncle Joe, whose whip was working exceptionally well. Finally they came to a nest of wasps clinging to a bush, and the traveling man said: "Uncle Joe, let's see you get that one."

"No, sir; no, sir," said the driver; "I don't want to bother them at all—they is organized."

Every day, somewhere in the United States, advantages are being gained for burnable building materials. New ordinances are being written and building codes are being revised to give greater latitude to the use of inflammable materials.

This is done in the face of a natural tendency on the part of the building public to want safer buildings. Building officials and fire engineers fight for better regulations, but they are no match for the strongly organized lumber interests that thrives upon burnable construction. In practically every contest between officials and the lumbermen, where a point of safety in building is involved, the lumbermen win.

In South Bend, Ind., a few months ago the lumbermen were successful in having the new building code changed to permit the wider use of wooden shingles. The lumber journals boasted of it.

In Augusta, Ga., during the first week of March the lumber organizations were able to extend the use of the wood shingle in that city. Less than two weeks later fifteen solid blocks of residences with wooden roofs were burned to the ground, leaving many hundreds of people homeless and costing individuals more than a million dollars in loss. This fire was directly chargeable to wooden buildings and the shingle roof, for it all grew from a single residence fire started by a boy.

With such evidence as this being piled up day after day against the use of inflammable materials, how easy it would be to combat the lumbermen if proper support was given a national organization such as the S-A-F-E!

The S-A-F-E is covering ground in proportion to its support. If a fair proportion of the manufacturers of fire-resistive materials and safety equipment would join the movement it could be on the ground in such fights as were lost safety in Augusta and hundreds of other places.

It is admitted that there are strong organizations among the trades interested in fireproofing, but the S-A-F-E is the only movement that gives an opportunity for team work among all the trades.

Much is now being done with a view of promoting fire prevention through the increased use of fire-resistive materials simply displaces one good material with another. Too often, in fact, there is unnecessary competition between good materials, and while they fight, inflammable building continues.

The reason that the lumber interest succeed in knocking out fire prevention and safety measures is that an **organization** is opposed by a **group of individuals.** It is like a pick-up nine playing a big League team.

Team work is essential, and, with the exception of the effort being made by The S-A-F-E, there is no team work in the contest for fire elimination.

Mr. Manufacturer, don't you think it will pay you to join with others of allied interests and all work together to promote safe building?

Recent Building Projects

Sixty thousand dollars is the estimated cost of two brick apartment houses which Achille Ermette intends building at 478-484 Park avenue, Weehawken, N. J.

An extension to the city hall at Newark, N. J., will shortly be undertaken, the public building committee having approved the plans prepared by Architect Jordan Greer.

Replacing the building recently burned, a new city hall and fire station has been erected at San Marcos, Tex. The structure is two stories in height. Brick and concrete were the materials used in its construction.

Doyle & Murphy, of Willimantic, Conn., were the successful bidders for the erection of six new buildings to be erected by the State for the Epileptic Colony at Mansfield Depot. The appropriation for the work is $193.000.

Other work underway by Doyle & Murphy include the State Trade School at Putnam, and the remodeling of the Weldon block at Worcester.

Within a few days work will be started upon a new refinery, which the Revere Sugar Refinery (owned by the United Fruit Company) plans to erect near Boston, Mass. When completed it is figured the new building and the ground it occupies will have cost nearly $2,500,000.

Plans have been filed by Frank Weisberg and William Codel for the erection of four apartment houses at Park avenue, near Tenth street, West New York, N. J. When completed the buildings, which will be of brick construction and five stories high, will cost $140,000.

Contract for the erection of the steel work on the plate and angle and forge shops to be built at the Elizabeth (N. J.) plant of the S. L. Moore & Sons' Corporation was recently awarded Levering & Garrigue, New York City. The cost of the work will approximate $70,000.

The machine shop, which is the first of the new buildings to be started, is to be a fireproof structure of steel frame with curtain brick walls and concrete foundations and floors. The roof also is to be of concrete and the sashes of steel. The foundations of this structure have been built on more than sixty piles reinforced with concrete.

Union Hill, N. J., is considering the erection of a new public-school building.

The owners of Rosenberg's department store, Evanston, Ill., burned on the 20th ultimo with a loss of $60,000, plan to rebuild a four-story structure.

Immediately adjustments of its loss be had, the Wysox Produce Company, of Wysox, Pa., intends rebuilding plant destroyed by fire on January 24th last. The fire was thought to have been caused by sparks from a passing locomotive.

With a view to securing helpful criticisms of the plans tentatively agreed upon for the $1,000,000 annex to the Adolphus Hotel at Dallas, Tex., the management of the proposed enterprise will put up a model of the "Annex," and invite the inspection thereof of hotel experts and others whose judgment is valuable. The dummy will be of rough lumber, 100 by 147. A model floor will be shown, all rooms completely furnished.

Plans for the erection of three apartment houses on Palisade avenue, West Hoboken, N. J., were filed a short time ago by the M. S. W. Construction Company, of Jersey City. The buildings will be of brick and will each be four stories in height. When completed their cost will be close to $88,000.

Fire of unknown origin resulted in a $100,000 loss to the Kuhles and Stock Company, of St. Paul, Minn., late last month. It is unlikely that the destroyed building will be replaced at this time, though the management figures upon rebuilding next year.

A science hall is to be erected by the Southwestern University of Georgetown, Tex., contract for its erection having been awarded on the 5th inst.

The building will be three stories and basement, of reinforced concrete, with brick facing and hollow tile for all outside walls. It will be absolutely fireproof, timeproof and free from vibrations, so that the most exact quantitative work may be done. All floors, partitions, stairways, etc., are to be of reinforced concrete construction; even the roof is to be of reinforced concrete. The building will be heated with the latest improved vacuum steam-heating system and will be furnished with the most modern sanitary plumbing, electric lighting system and has a most perfect system of windows for lighting and ventilation.

M. L. Waller & Co., of Fort Worth, are the architects.

SAFE HOMES

A DEPARTMENT OF "CONSTRVCTION"

Devoted Exclusively to the Interest of the Home Builder

Edited by Ralph P. Stoddard

WITHIN the past week there have come to the desk of the editor two newspapers containing advertisements of real estate men offering fire-safe homes exclusively. One concern is located in New York and the other in Cleveland. Both are specializing in ready-built houses with fireproof exteriors.

This might be called by some an innovation.

It simply is a result of a growing demand for safe homes.

In Cleveland there has just been organized a second company building fire-safe homes exclusively. Real estate operators are seriously considering the placing of restrictions upon their properties that will make it impossible to build a frame house in them. The present season probably will see at least two such allotments in Cleveland.

There are throughout the country a few residence additions where only houses with fireproof exteriors may be erected. These have prospered, and are the show places of the cities boasting of them. But it is only within the past two years that real estate operators generally have given consideration to this form of restriction upon their properties.

Those who look ahead realize that the day is not far distant when the frame house will be out of date and out of demand. Rapidly increasing prices of lumber have so nearly wiped out the difference in first cost between fire-safe houses and the burnable kind that the chief obstacle in the way of better building has disappeared.

Home builders are accustomed to disregard high upkeep charges and fast depreciation in order to save a little in first cost. They have been educated in America to the instalment plan. Nothing is expensive, they think, if it can be met in "easy" payments.

It is this characteristic of the American that makes him wink at a quarter of a billion-dollar fire waste every year.

"The insurance companies will pay it," he says. "I should worry!"

You explain to him that he, not the insurance company, pays the bill through added cost in everything he buys.

"What's a cent or two here and there? I'll never miss it," is the reply.

This explains why only three men out of every thousand in America are independent when they arrive at the age of sixty years. The other nine hundred and ninety-seven looked only to the present —the "first cost." The three look to the future.

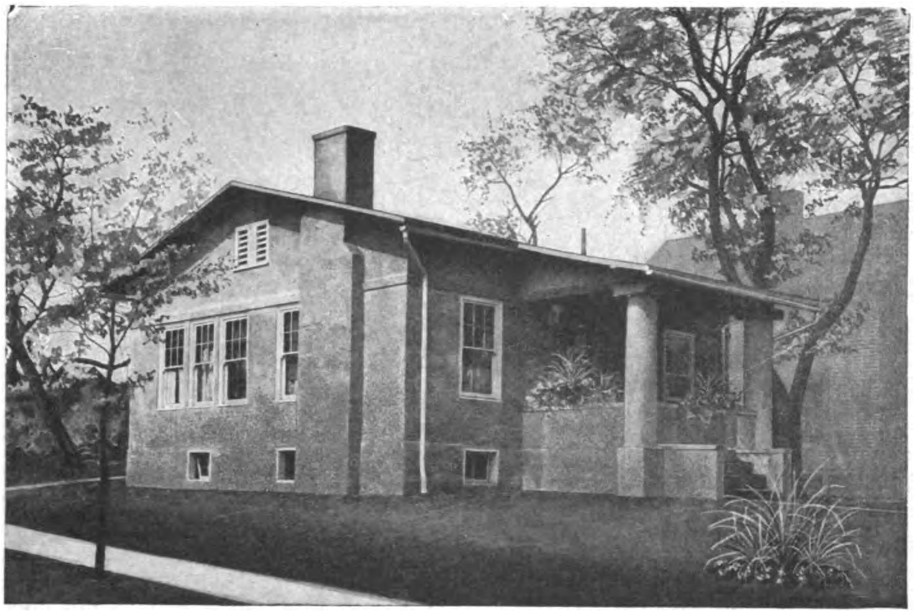
The man who "saves" two hundred dollars in building a home when he knows that the saving will cost him fifty dollars a year for the remainder of his life is a wasteful man. The same policy in all his dealings will make him a bankrupt.

But it will be easier to convince a man that he should build a permanent home with this first-cost bugbear taken from his sight.

That is why there is an increasing demand for fire-safe homes that justified progressive real estate operators to specialize in that type.

For more than one hundred years the insurance companies have carefully compiled statistics showing actual results, and from these they say: that the chance of a bad fire in your city is from two to three times as much if buildings are all of frame construction, as it is, if they are of firesafe material.

If the facts and figures were properly presented in your community, the erection of frame buildings would be practically abandoned, not from compulsion but from choice.



A FIRESAFE BUNGALOW

AN objection to living in the outlying suburbs hard to overcome is the inadequate fire protection. A fire in such a district usually means a building burned to the ground, resulting in practically a total loss. Even if the building and furnishings be insured, there is a loss of residence and probable loss

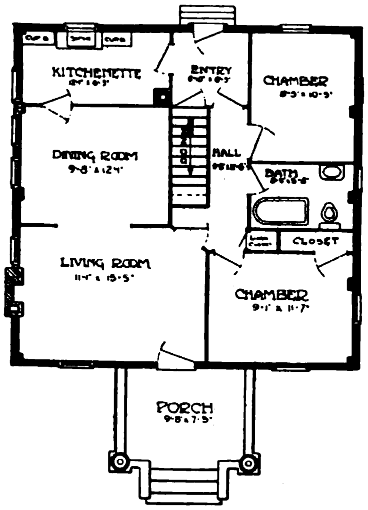
It's not new, but it has a lesson for the manufacthistle over yonder?"

The only true solution of the suburban residence is to make it consistently fireproof; that is, to eliminate wood from its construction except for interior and floor coverings.

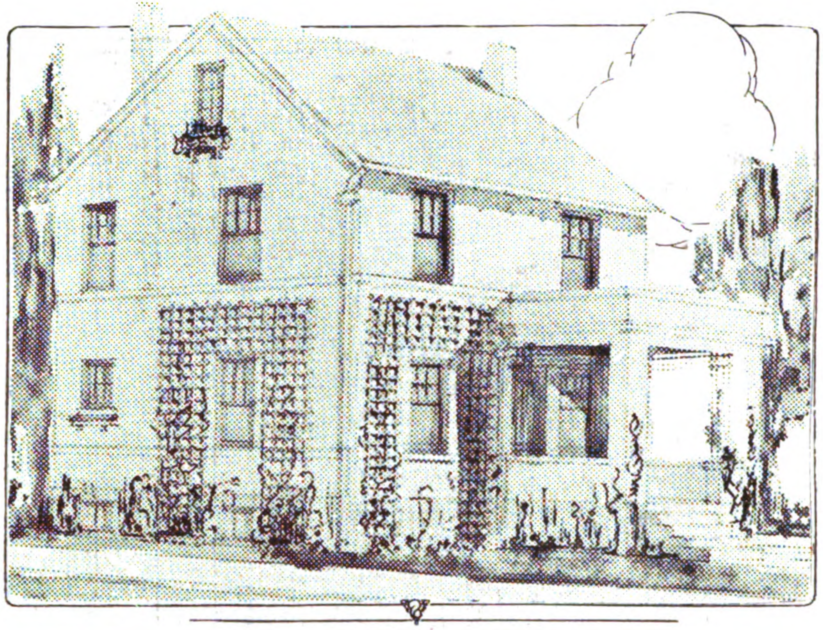
Heretofore the price of such construction has been considered prohibitive for the average person. It has remained, however, for the manufacturers of expanded metal to demonstrate that fireproof construction is not only within the range of the average purse, but that the difference is so slight as to make it good judgment to put the additional money into a home to eliminate insurance and to provide for one's not being turned out of doors in the dead of winter.

The five-room bungalow shown is one of the fireproof buildings erected by the expanded-metal makers—in this case, the General Fireproofing Company, of Youngstown. It is constructed of steel framework set upon tile foundations. This steel framework is covered with expanded metal, and this is completely imbedded in concrete. The result is a virtually monolithic concrete building, including floors, stairs, ceilings and roof. There is nothing in this house to rot or need repair, and it will not burn, even if a fire were to be kindled inside it.

A bid of $3,200 for the construction, complete, of this building was made by a Cleveland contractor. This represents what would be the average cost of it, as this man obtained no concessions on material and had no better facilities for purchasing it than any contractor would have in any other city.



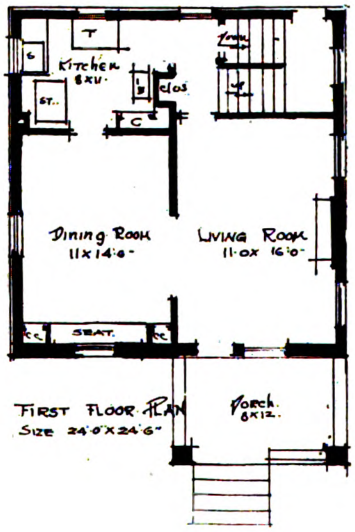
FIRST FLOOR PLAN



A PRACTICAL HOME

For the man with from $3,000 to $3,500 to invest in a home it is possible now to place it in a property which will be at once permanent, firesafe and beautiful.

In the past this has been largely a matter of surmise; but now two houses have been built in Cleveland which meet the requirement of "the $3,000 house."



One of these is illustrated in the accompanying cut. The other was illustrated recently in CONSTRVCTION.

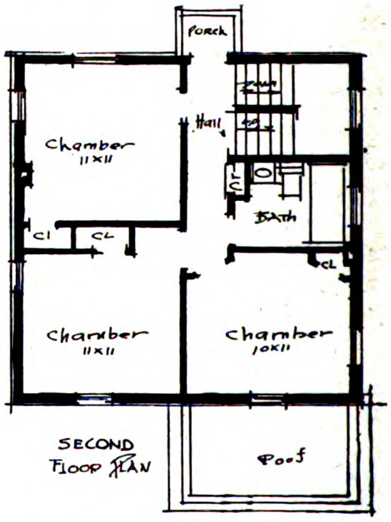
It will be seen that this little home is a practical one in every way. The architect has effected an excellent economy of space and has produced a compact plan which will save many steps for the housewife.

The placing of the stairs in a rear corner results in a short-cut from the kitchen to the upper floor. The arranging of the dining and living room both to the front of the house is another much-sought-after feature of the present-day home.

All bed-rooms are of good size and are well lighted and ventilated. Likewise, all have good-sized closets. The small deck over the rear entrance porch provides an airing place for clothes, etc.

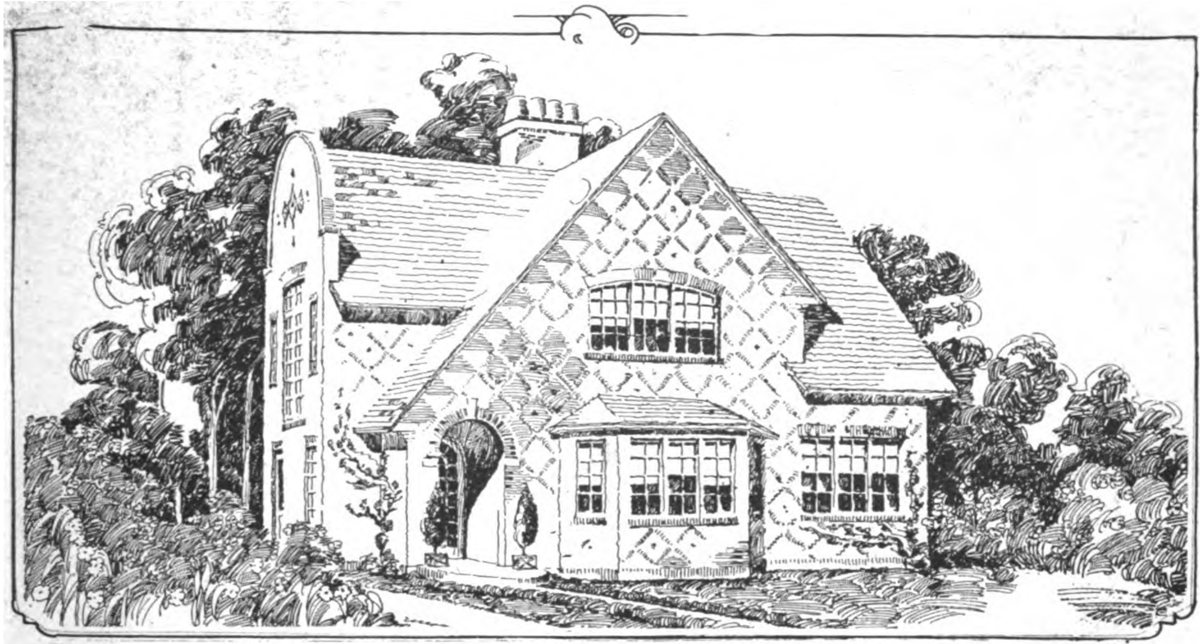
A bed-room and sitting-room are provided in the third story. The basement partitions are of hollow tile, giving a weatherproof fruit and vegetable cellar and a dustproof coal cellar.

This house is built of hollow, burned clay tile, faced with brick, and is roofed with variegated slate. It will be noted that wood has been virtually eliminated from the exterior, thus reducing painting and other upkeep to the minimum.



Taken as a whole, it is an excellent type of firesafe home, and one which will compare favorably with its neighbors, no matter how pretentious.

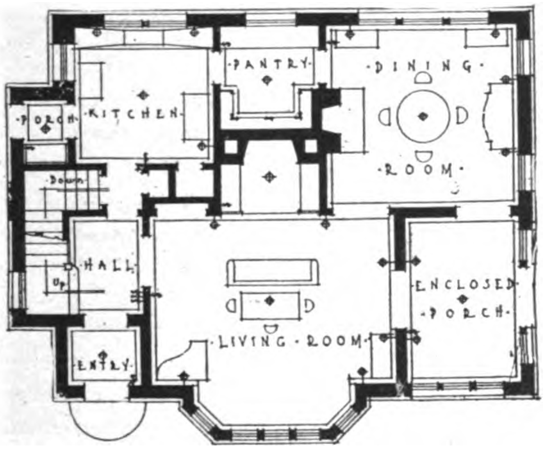
AN ARTISTIC RESIDENCE



FIREPROOF HOUSE HAS MANY UNIQUE FEATURES

When one has from $7,000 to $8,000 to put into a home it is possible to obtain most of the comfort and convenience to be found in a house of many times the size and cost. This amount of money to-day will build a fire-safe residence of ample size and of the best materials throughout.

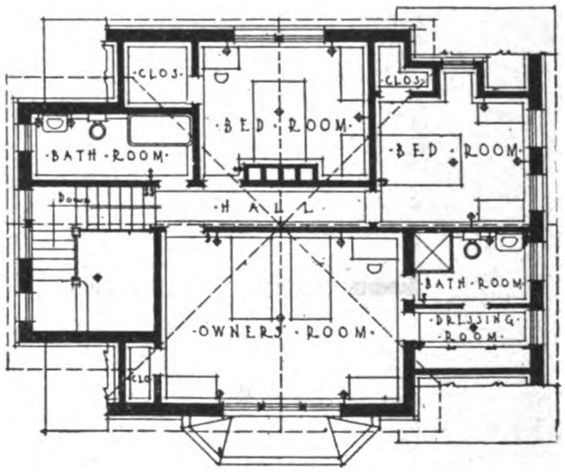
The house shown is an example of what is possible of attainment for $7,500, which is the cost as estimated by the architects. They aimed at a spacious effect, at the same time keeping the house comparatively small on the ground; and they succeeded exceptionally well.



·FIRST · FLOOR · PLAN·

The ground floor has a number of excellent features, among them the entrance hall, the large living room bay to provide additional light, the recessed porch to be screened in summer and glazed in winter, the large ingle-nook and a roomy pantry.

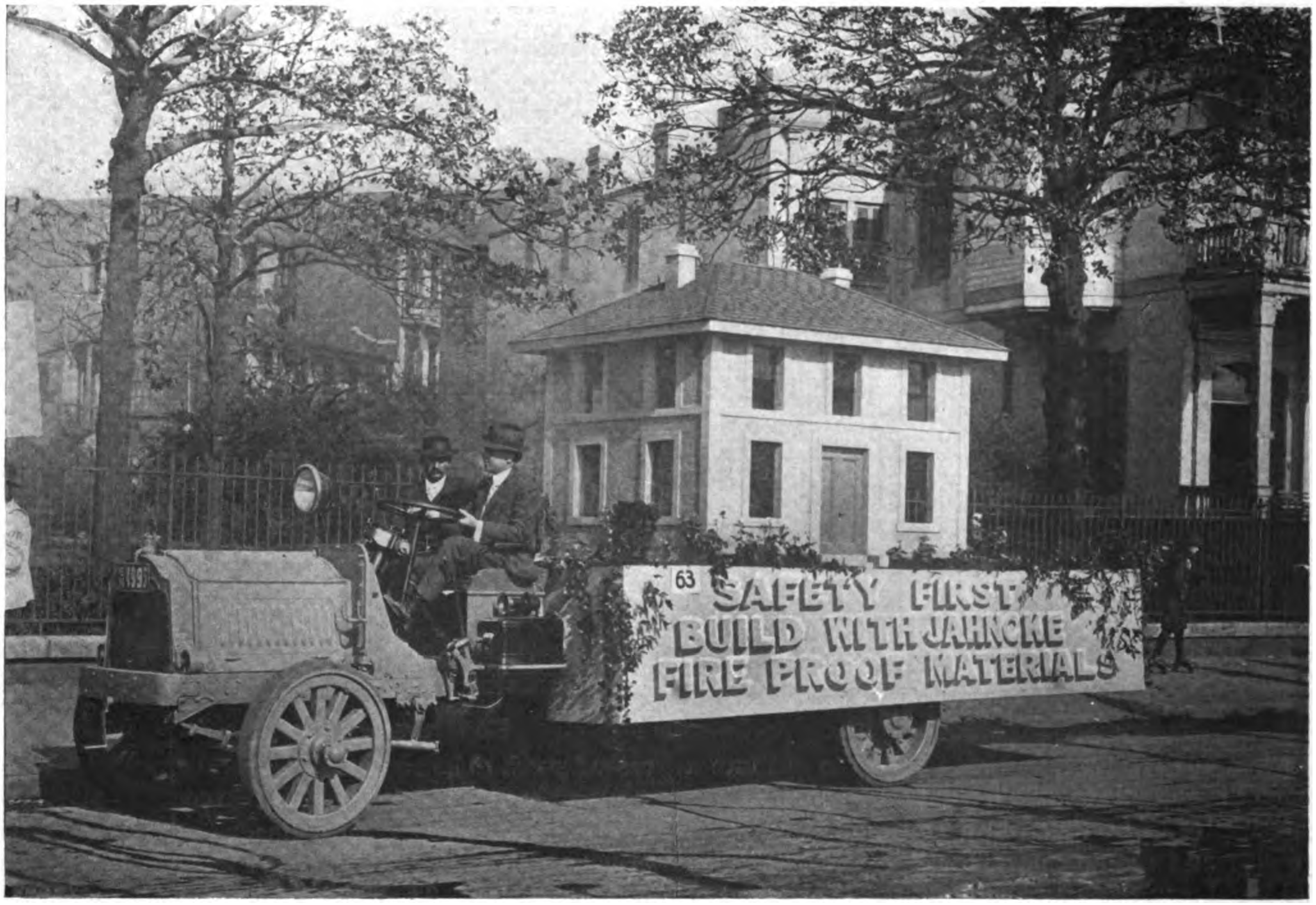
The owner's room, with its dressing room and private bath, with shower, is the feature of the second-story plan. The other bed-rooms are of good size, and exceptional provision is made for the lighting and ventilation.



·SECOND · FLOOR · PLAN·

It will be noted that a distinctive feature of every room in this house is that there is ample room for furniture; in fact, provision has been made for practically every piece which ordinarily would be used.

In the design of the exterior, building is used to the best possible advantage. The diamond-shaped pattern gives an artistic finish to a home that is in every way beautiful and complete.



S-A-F-E Materials at the Mardi Gras

Members of The Safe who are alive to its tremendous value, never seem to lack opportunity to advertise firesafe materials in a way that brings an actual cash return, aside from the value accruing to them from the general promotion of the commodities they sell.

This picture shows how Fritz Jahncke, a Safe member and one of the leading material dealers in New Orleans, took the opportunity of one of the Mardi Gras parades to "put over" a demonstration of Safe materials.

In addition to the one shown, Walter Jahncke had several of his trucks in this pageant, each float a distinct argument for the use of firesafe building supplies and each one a well-paying advertisement for his business.

Public demonstrations offer opportunities for getting before the public unequaled by other means. Manufacturers and dealers in fire-resisting materials ought to take advantage of them whenever they present themselves.

Manufacturers or dealers interested in the sale of incombustible materials are invited to send in photographs of interesting exhibits and sales ideas. They will be published in these pages from time to time.

WEATHER:
Always warm in winter and cool in summer if you are in a firesafe home, office or factory building.

The Fireproofing News

CONTAINING DETAILED DESCRIPTIONS OF NEW DEVICES AND APPLICATIONS OF MATERIALS WHICH ARE OF REAL VALUE IN FIRESAFE BUILDING: ALSO NOTES ON THE LATEST BOOKLETS, CATALOGS AND OTHER FIRESAFE LITERATURE, WITH OTHER ITEMS OF INTEREST TO THE FIREPROOFING FRATERNITY

LATEST EDITION

Copyright by Construction Publishing Co., of New York, N. Y., 1916

New York City, N. Y., April, 1916 Priceless

LUMBER INTERESTS TO THE BAR OF PUBLIC OPINION

THE CRIMINAL WOOD SHINGLE HAS NO PLACE IN MODERN BUILDING PRACTICE

Lumbermen, What Have You to Say to the Charge?

Paris, Tex.
Augusta, Ga.
Bangor, Me.
Columbus, Ga.
Salem, Ga.
Baltimore, Md.
Patterson, N. J.
Rochester, N. Y.
Galveston, Tex.
Nashville, Tenn.
Jacksonville, Fla.
San Francisco, Cal.

These and scores of other cities have to their extensive loss and bitter sorrow paid the awful penalty likely to be faced any hour by every city, town and hamlet in America which is under the tinder-covered, aviating-brand material commonly known as the wood shingle.

East Nashville, Tenn.; Augusta, Ga., and Paris, Tex.—Within twelve hours sweeping conflagrations occurred at the above widely separated Southern points on March 22. Hundreds of homes and mercantile buildings were destroyed. *The editorial and news columns of local papers are unanimous in their condemnation of the wood shingle as one of the prime causes of the disasters.*

Only one month ago Augusta, Ga., passed an ordinance permitting the continued use of wood shingles —*because the well-organized lumber interests marshalled their strong forces and went into the city to fight for the wood shingle, while the unorganized firesafe building material makers did nothing.*

It was a clean sweep for lumber!

Now, but one month later, because of lumber the flames have made a clean sweep at Augusta! A bitter lesson, but one necessary to awaken people to the utter foolishness of living and working in tinder-covered boxes.

As CONSTRVCTION has often mentioned, the makers of firesafe materials are getting but one per cent of the business which ought to be theirs. *They will never get the business justified by the merits of their merchandise until they learn the lesson of organized, co-operative effort*—until they get into cities where there is agitation for the continued use of wood shingles and put up the battle against such criminal legislation which the lumber men do in its favor. The past year is replete with instances of defeat for firesafe building laws because of the wonderful activities of the lumber associations and the astonishing inactivity of the men who supply fireproofing materials.

BIG AUTOMOBILE PLANT EQUIPS OFFICE WITH FIRESAFE FURNITURE

The Willys-Overland Company is constructing at Toledo, Ohio, its new Overland Building. That the far-sighted executives responsible for the success of this great manufacturing organization propose to take no chances on the old-fashioned wooden office equipment, as did the Canadian House of Parliament, but intend that their business records shall be properly and safely housed in modern all-steel receptacles, that their office force shall use in its routine work furniture of the same material, and that they themselves shall have the satisfaction of sitting at and attending to each day's business upon desks of steel, is shown in the fact that the Art Metal Construction Company has lately received an order which will mean the installation of Art Metal equipment for this concern.

* * *

Advertising takes your product or service out of the factory or office and holds it up to the gaze of possible buyers.

MERCHANT & EVANS CO. FORCED TO EXPAND AGAIN

Now Occupy New and Larger Office and Warehouse in Philadelphia

An anniversary is a notable event in the history of any business, but the fiftieth anniversary of an organization like the Merchant & Evans Company should directly interest the metal trade and its allied industries.

In 1866, Clark Merchant, who had distinguished himself in the United States Navy, and retired with the rank of Lieutenant-Commander, established the business in Philadelphia as Merchant & Company, dealing principally in brass, bronze and copper in all its forms as then manufactured, and trading also in tin plates and other metals that were imported from England or other foreign countries.

Period of Rapid Expansion

Under his able management the business expanded wonderfully, and soon necessitated removal to larger quarters. At this time the heaviest importation of Merchant & Company was in roofing tins, and chiefly of the brand known as "Gilbertson's Old Method," which was so much superior to any imported terne plate that it far exceeded the sales of any other brand sold in the United States.

After the McKinley tariff went into effect, the English makers of the "Gilbertson's Old Method" brand desired to reduce the weight of the coating that had been so rigidly guaranteed by Merchant & Company, and rather than force an inferior tin on the trade, Merchant & Company gave up the agency for this tin, and decided to erect a dipping plant in Philadelphia to produce plates in this country of equal or better quality. As a result the "Merchant's Old Method" brand of roofing tin was placed on the market and found to be of distinctly better quality than the "Gilbertson's Old Method" brand; in fact, so markedly superior that in a relatively short time the sale of the "Gilbertson's Old Method" brand in this country declined, and finally ceased altogether.

Powell Evans Assumes Control—Variety of Products

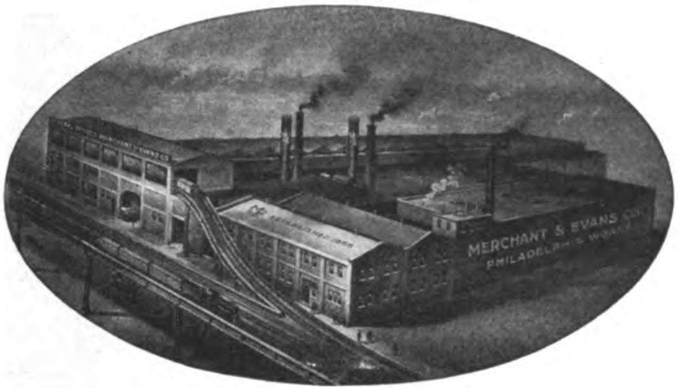
The continued growth of the business made it necessary to open branch offices and warehouses at several important points in the United States, and enlarge the line of metal products. The co-partnership of Merchant & Company was also changed to a corporation, under the style of Merchant & Company, Inc., with Clark Merchant as its president. This style continued until the death of Mr. Merchant, after which Powell Evans assumed control of the business, which is now conducted under the name of Merchant & Evans Company. Mr. Evans is an engineer of international experience, and seeing the possibilities available to manufacturers of gasoline propelled vehicles and parts thereof, long before the present European war created such a tremendous demand for motor trucks—added to the already extensive line of metal products handled by Merchant & Evans Company — automobile clutches, alignment-joints, rear axles, jackshaft transmissions, grease cups, metal tire cases, and finally completely erected gasoline motor trucks and tractor trucks.

Mr. Evans is widely known as one of the best-posted men in fire prevention and protection affairs in this country, and is chairman of the Fire Prevention Committee of the Chamber of Commerce of U. S., the National Hardware Association and the Fire Prevention Commission of the city of Philadelphia.

During the existence of the old International Sprinkler Company, of which he was president, he designed and marketed very large quantities of sprinkler heads, valves and other approved automatic sprinkler devices. Quite recently he secured laboratory approval of an Almetl type of fire door.

New Tin Plate Mill Erected

The large amount of business secured for automobile parts, and the increased demand for the brands of tin and terne plates made by this company, necessitated building a new modern tin plate mill, anl this was erected at Warwood, W. Va. (a suburb of Wheeling), where thousands of boxes of high-grade roofing and Bright plates are turned out annually.



New Office and Warehouse to Meet Present Demands

To fittingly celebrate its fiftieth anniversary, and to keep abreast of the growing demands for the products of this company, a large modern office and warehouse has been built adjoining its works on Washington avenue, between 20th and 21st streets, in Philadelphia, and the company has now completed removal of its general offices and warehouse to this new location.

Rapid motor trucks of its own manufacture are used daily to make free delivery into all parts of the city, and in respect to service, range of metals and extent of stock, the Merchant & Evans Company is recognized as one of the premier metal houses in the United States.

This company now has plants in Philadelphia, Wheeling and Chicago, and offices and warehouses in Philadelphia, New York, Baltimore, Cleveland, Chicago and Kansas City, with a large force of traveling representatives. It not only covers the entire United States, but is conducting an import business of increasing volume.

◆

Spreading a gospel of possibilities is the aim of advertising.

ERADICATE COMMERCIAL DISEASE, SAYS NATIONAL CHAMBER PRESIDENT

"Not only must we cultivate commercial health, but we must eradicate commercial disease." Such was the opinion expressed by R. Goodwyn Rhett, the newly elected president of the Chamber of Commerce of the United States to various commercial organizations before which he recently spoke. Mr. Rhett addressed the Association of Commerce in Peoria on March 14, the Chicago Association of Commerce the next day, and the Kansas City Commercial Club later in the week. "Commercial disease," Mr. Rhett said, "is just as real as physical disease, and its prevalence has just as harmful an effect upon industrial growth as the prevalence of physical disease has upon the growth of population."

"One of these commercial diseases is 'pessimism'—which too often masquerades under the synonym of 'conservatism,'" Mr. Rhett explained. "Pessimism amongst your prominent citizens is a commercial cancer which eats out the heart of enterprise. True conservatism is a balance wheel which is very essential to successful business: but pessimism that sees only failure, calamity and disaster for everything existing or proposed is as much to be dreaded as a noxious physical disease would be dreaded by your health department."

"Another commercial disease is commonly known as '*knocking*.' It is quite different from pessimism, yet almost equally harmful. It is commercial gossip—repeating disparaging rumors about business men and enterprises with an added touch of exaggeration, attributing low or mean motives and finding fault generally, merely because of the pleasure of fault-finding. And then the 'sucker' with his 'What am I to get out of it?' sapping your strength with his inordinate selfishness. If you wish your community to flourish industrially and commercially, endeavor to eradicate such commercial diseases as well as to cultivate a genuine co-operative spirit."

Need for National Co-operation

Mr. Rhett said that just as it was found that individual efforts in a city or town were futile, and co-operative efforts through local chambers of commerce were necessary for the development and growth of a community, so it has been found that a co-operation of local chambers is equally necessary to secure those larger benefits which can only come to a community from beyond its immediate environments.

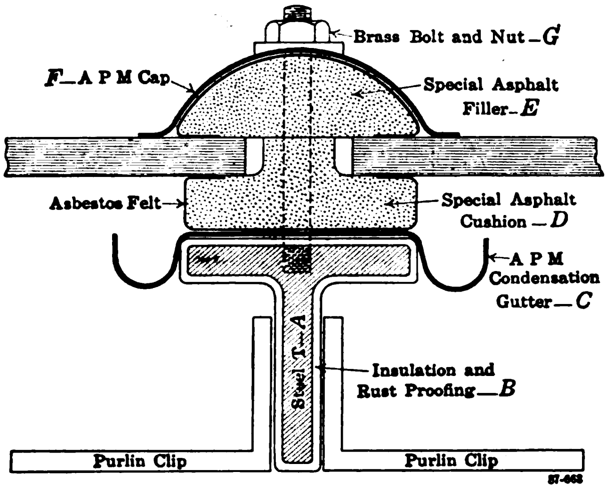
"If you stop short of the larger co-operative work," Mr. Rhett said with emphasis, "then you have failed to grasp the full meaning of a modern chamber of commerce. There are many laws being enacted and many things being done which affect your community and a great many others similarly situated. You can only hope to have any influence upon these laws or upon these actions through that same co-operation which you have found effective in local affairs."

Mr. Rhett said that some of these laws and some of these actions spring from the National Capital and must be reached by the co-operation of chambers located in all parts of the land. "For instance," he pointed out, "there is a body of five men in Washington known as the Federal Trade Commission, which has jurisdiction over competition in all trade which extends beyond the borders of each State. It has the power and is charged with the duty of determining whether the competition in which the individual is engaged is fair or unfair, and of putting a stop to it in the event of the latter."

ASBESTOS PROTECTED METAL CO. FEATURES NEW "WAUGH" GLAZING CONSTRUCTION

The lighting of any enclosed area has a direct effect upon all operations that are carried on therein. Upon the lighting depend largely the temper and health of the occupants, the quality and quantity of their work and the degree of order and cleanliness that is maintained. Owners and industrial engineers are giving this matter more attention, and practically all agree that the best form of day lighting is obtained from the roof through saw-tooth fronts, skylights, or monitor sash.

Experience has shown that on account of practical defects roof lighting is generally associated with certain drawbacks, such as leakage, condensation drip, corrosion, glass breakage, etc. All of these are annoying, increase the cost of maintenance and interrupt production. Complete satisfaction has been considered almost unattainable, and in consequence many architects have abandoned the use of skylights altogether. Durability and cost of maintenance have been sacrificed in order to exploit constructions having but one or two alleged good features, or to produce something which could be sold at a low price.



By applying the same scientific principles and thorough methods which have placed other Asbestos Protected Metal products in a distinct class, this company has arrived at what may be safely accepted as practically a perfect solution of roof-lighting problems. Asbestos Protected Metal glazed structures are invariably safe against deflection, positively water excluding and corrosion-proof under all conditions of service and fire-retardant. In them cost of maintenance has been practically eliminated—and this has been accomplished without increasing the first cost.

This new development in Asbestos Protected Metal products has been named "Waugh" Glazing Construction. The distinguishing features of this system of construction can best be appreciated by following a brief description of a particular application. Consequently we give below in some detail a description of the "Waugh" system as applied to skylights.

Bar Beam.—The rolled steel bar, A, is a plain section—usually standard—and its maximum deflection under normal live loads can be readily determined. Its moment of inertia can generally be found in the various hand books. The maximum deflection of the "Waugh" bar is never such that glass breakage would result from bar weakness. Steel skylight bars are generally designed, primarily, as gutters to carry away condensation and leakage; secondarily, as glass supports; hence, they are usually thin, rust-inviting steel water-troughs — and their initial stiffness is often indefinite and difficult to calculate. Even if they have sufficient initial stiffness, obviously they cannot retain it. It is impossible for leakage water to get to the "Waugh" bars—and the condensation gutters are entirely separate members.

We recommend that the bars be rust-proofed in all cases, but for some favorable conditions a paint film sometimes gives sufficient protection. It will be noted that all exposed surfaces of the "Waugh" bars are easily accessible from below for periodical repainting. This is not true of trough-shaped bars having concealed inner surfaces—where corrosion will inevitably occur. It should be further noted that "Waugh" bars, in their lightest section, have twice the usual thickness of other skylight bars.

Rust-Proofing. — The most persistent enemy of steel-glazed structures is rust. To insure the metal against its insidious action adequate and permanent protection must be provided. Paint or galvanizing is not permanent—and in most cases for which either of these temporary protections is specified proper inspection of the materials and their method of application is not practical. But, particularly for comparatively light steel products, is not the protection of the steel as important as its strength of fabrication? That consideration of methods of protecting steel permanently against corrosion is as important as the study of stresses and deflection is self-evident. The great weakness of steel is its susceptibility to corrosion, the action of which is to deteriorate and destroy all of its essential qualities.

"Waugh" bars are covered and hermetically sealed by a special coating, B, applied by a careful and highly developed process of the company. The remarkable properties of this coating can best be appreciated by reviewing briefly the process employed and considering the materials used in its application. These properties are developed by using each constituent material to overcome the inherent weakness of the others, thus eliminating their weaknesses and uniting and multiplying their qualities of excellence.

To begin with, the steel is freed from grease, moisture, oxides and every other surface impurity.

To protect the steel from corrosive agents it is heated to a definite and uniform temperature, then it is immersed in a bath of special asphaltic compound, which covers it with a water- and gas-proof coating that effectively seals it. Long experience has demonstrated that, when properly applied, asphalt furnishes a perfect protection for steel against corrosion, so long as the asphalt itself remains intact.

To maintain the beneficial properties of this special asphaltic material, it is protected against the action of light, heat, solvents and mechanical abrasion by a tough, opaque and insulating covering of pure asbestos felt, applied to all surfaces of the bar and firmly pressed into the asphalt, while it is soft and hot, thus permanently binding the two substances together.

Finally, the asbestos is itself protected by a coating of special fume- and moisture-proof hardening material, the nature of which depends upon the particular service to be rendered. This surface treatment is varied to withstand different chemical fumes; for instance, one form is used for muriatic or hydrofluoric exposure, another for strong alkaline conditions, and so on.

The protection afforded by the above described coating process is perfect and permanent under any conditions that are encountered in practice: neither acids nor salts can affect this coating. It is heat- and fire-resisting—therefore minimizes condensation, reduces the effect of fire upon the steel and also retards and reduces temperature changes in the steel and therewith expansion and contraction. It is also an electrical insulator and effectively protects the steel from stray currents and galvanic action.

Condensation Gutter. — With a single thickness of glass there will sometimes be condensation to provide for, and if drip is to be avoided it must be collected and disposed of. In the "Waugh" design such condensation is carried off by the gutters, C, which are fitted snugly over the top of the bars and serve as anchors for the bolts by means of which the glass is held in place. These gutters may be made of any sheet metal, such as copper or galvanized iron or steel, but the company recommends Asbestos Protected Metals in all cases, because, as explained above, it is especially treated to withstand the adverse weather conditions faced by roofs. Asbestos Protected Metal is permanent under all conditions.

Glass Cushion.—The glass rests directly upon the cushion, D, of asphaltic compound, which provides a broad, continuous and perfect bed. The cushion is pliable and resilient, yet firm. It lies below and *continuously* between the glass plates, preventing their contact with hard substances, *even the bolts,* thus avoiding destructive strains. The asphaltic material of the cushions is protected from the action of light, heat and the atmosphere by a layer of toughened asbestos felt.

The cushion material which supports the glass also has an insulating quality, which most effectively keeps the steel bars at the same temperature as the inside atmosphere. Thus condensation on the bars is prevented. This is especially valuable when the bars are merely painted instead of being rustproofed.

Cap Filler.—The outside edges of the glass plates and the joints between them are covered and bridged with the half-oval section of asphaltic compound. It leaves no hollow spaces beneath the cap. It is not porous and will not absorb or hold moisture. This filler, because of its resilient and plastic character, enters all depressions and makes a perfect contact with the wavy glass surface. It adheres to the glass, makes a perfect seal, prevents capillary attraction and renders it impossible for air, water, snow or dirt to enter.

Caps.—The cap, F, serves as a protection for the cap filler against the elements and preserves indefinitely the valuable properties of the latter. It may be made of any suitable sheet metal, but, as explained before in the case of condensation gutters, asbestos-protected metal is recommended.

The shape of these caps has been carefully chosen with due regard to both appearance and service. They are only five-eighths of an inch high and have no sharp angles. They offer no place for foreign materials and dirt to lodge, and in the winter they do not form fences to catch and to hold the snow.

Moreover, because of the low flat arch shape, it is possible to draw up the cap bolts until the whole cap is under tension without breaking the glass, and this tension is then utilized to lock the nuts. The major portion of the pressure—in fact, all of the direct pressure—is taken up by the cap filler and distributed by it evenly over the entire area of contact.

Cap Bolts.—The cap bolt, nut and washer, G, is of special shape and is made of non-corrodible metal, such as brass, phosphor bronze or monel metal. The broad flat head of the bolt rests upon the bar and the bolt extends upward through the condensation gutter, the cushion, the cap filler and the cap, thus clamping the glass and the cushions between the condensation gutter, C, and the cap, F. The clamping of the gutter around the bar, A, secures the whole structure firmly in place.

The bolts are spaced not more than twelve inches between centers. They are designed and guaranteed to sustain a load of 150 pounds each without damage, and since they have their bearing directly upon the load-carrying bars, and since the latter are of sufficient strength and stiffness, bridge planks may be placed across the tops of the bolts to facilitate the work of cleaning the glass without putting any extra pressure upon the glass and without fear of breakage.

Installation.—As may be readily seen from the above description, the assembling of the construction is decidedly simple. In fact, the saving on this score alone largely offsets the extra cost of rust-proofing, therefore the rust-proofing should never be omitted unless it is desired to overlook entirely the cost of maintenance and repairs.

Cost.—The first cost depends upon a number of things, such as the style or shape of the structure, the pitch and span of the bar-beam, width and kind of glass, the kind of curbs and purlins and upon the kind of materials to be used for the gutters, caps and bolts. The "Waugh" system of glazed construction is one of the cheapest on the market, because the first cost is the only cost and this is not high.

Uses of "Waugh" Glazing Construction.—The glazing methods described above, though pertaining to skylight work, are also pre-eminenty suited to many other classes of construction. "Waugh" construction is adapted to all kinds of glazing, whether it be for skylights, monitors, sawtooth fronts or plain windows. It is particularly efficient wherever the atmosphere contains actively corrosive elements, such as are present in paper mills, foundries, chemical factories, textile mills, dye houses, etc.

Its Characteristics.—Some of the characteristics which determine its choice are listed below:

Corrosion-Proof.—"Waugh" glazing is absolutely and permanently corrosion-proof against any kind of atmospreric conditions, either natural or artificial. It is not affected by acids nor alkalies.

Fireproof.—"Waugh" glazing is fire-retardant, the steel being everywhere protected from heat and flame by thick layers of long fibre asbestos felt.

Condensation-Proof. —"Waugh" glazed products are thoroughly insulated from the outside cold and therefore the interior metal surfaces take on the temperature of the inside air and, consequently, moisture does not condense upon them. Perfect and permanent provision is made for carrying away any condensation forming on the glass, so that there will be no drip, a feature which is especially valuable in paper and textile mills, where drip will damage the product.

Appearance.—"Waugh" glazing is architecturally satisfying in appearance. It retains its color and finish for an indefinitely long time. It is well suited for use in public buildings, railway stations, swimming pools and other places where, in addition to durability, appearance is of importance.

Upkeep.—"Waugh" glazing involves no cost of upkeep. Breakage of glass because of bar deflection is impossible. It does not corrode. It does not need painting.

Further details covering any form of structure to which "Waugh" glazing may be adapted may be had from the Asbestos Protected Metal Company, Pittsburgh, Pa.

NEW YORK TO HAVE LARGEST HOTEL IN THE WORLD

To go out and order the greatest hotel in the world quite as one would order a suit of clothes sounds like the dream of a rarebit fiend or the imaginary adventures of a modern Aladdin.

That, however, is just what happened in New York the other day when Charles H. Ingersoll, the watch manufacturer, president of the Commonwealth Hotel Construction Corporation, and his associates approved a contract with Hoggson Brothers, originators of the Hoggson Single Contract Building Method, for the delivery of a $15,000,000 hostelry.

The hotel is planned to be erected in the Times Square district of New York; the $15,000,000 is to cover the cost of the site, the building and its equipment. The building is designed to occupy an entire block front and is to be 28 stories high. It is planned to contain 2,500 rooms or more—nearly twice as many as the largest hotel now existing.

The Commonwealth Hotel Construction Corporation is a co-operative concern, which plans to have about 150,000 shareholders, each of whom, except the directors, will own a single share. The directors, in accordance with the laws under which the company is incorporated, will own three shares each.

It was desired to know in advance that the hotel building would not cost more than the sum which the corporation or association desires to spend. Hence the single contract, which covers the services of architects, engineers, builders and decorators, in addition to building materials and the furnishings, which are to be installed upon the completion of the hotel. The contract, in brief, binds Hoggson Bros. for a stated sum, to take a building site and within a stipulated sum to deliver a fully-equipped hotel, ready at the touch of a button to receive guests and give full service.

METAL EQUIPMENT AND FURNITURE WOULD HAVE TOLD A DIFFERENT STORY

Fire made a wreck of the beautiful Canadian Parliament Building. The extent of the damage was several lives and some $3,000,000. *Collier's Weekly* says, "It contained so much woodwork that the fire department was unable to save any part of the interior." It's a safe bet to lay that the reconstruction specifications will have much to say for firesafe material and little for its "substitute"—the stuff that made the ruin possible.

SHINGLE ROOFS ARE BLAMED FOR PARIS DISASTER

(*From Evening Journal, Dallas, Tex.*)

Shingle roofs are blamed with the Paris fire that destroyed probably $10,000,000 worth of property. J. R. Babcock, industrial commissioner and assistant to Louis Lipsitz, president of the Chamber of Commerce and Manufacturers' Association, who went with the first relief train to the aid of the stricken city, said this morning in an interview for the *Evening Journal*, "Paris will rebuild its city with non-combustible roofs."

STANDARD BARREL OF LIME

Representative Hay has introduced in the House a bill to standardize the barrel of lime. It was referred to the Committee on Coinage, Weights and Measurements. As introduced, the bill establishes a large and a small barrel of lime, the large barrel to consist of 280 pounds and the small barrel to consist of 180 pounds, net weight.

It states as follows: "When lime is sold in barrels the words—large barrel, 280 pounds, or small barrel, 180 pounds—shall be stenciled or otherwise clearly and permanently marked upon one or both heads, and in addition the name of the manufacturer of the lime and the name of the brand, if any, under which it is sold; provided, however, that when a jobber or local dealer in lime sells lime in 'quantities of more than one barrel and delivers it in barrels which are not headed and are used merely as containers, then nothing in this act shall be deemed to require that the barrels be marked as provided in this section, or that each individual barrel contain either of the standard weights established in Section 1, but he shall nevertheless deliver a total weight equivalent to the total weight of the number of large or small barrels represented, sold, or charged for by him, or purported to be delivered by him pursuant to an order.' "

Another section says that "it shall be unlawful to pack, or to sell, offer, or expose for sale any other barrels of lime than those established in Section 1; or to pack, or to sell, offer, or expose for sale any barrels of lime which are not marked as provided in Section 2; or to represent, sell, charge for, or purport to deliver as a large or small barrel of lime any less weight of lime than is established in Section 1, for a large or a small barrel, respectively; and any person guilty of a violation of any of the provisions of this act shall be deemed guilty of a misdemeanor and be liable to a fine not to exceed $500, or imprisonment not to exceed six months, in the court of the United States having jurisdiction."

TO AID IN PROMOTING CLOSER ASSOCIATION THROUGHOUT AMERICAS

The board of directors of the American Society of Civil Engineers has authorized the appointment of representatives of the society to act jointly with similar committees of the three other national engineering societies, for the purpose of promoting a closer political, social, scientific, commercial and industrial association throughout the Americas known as Pan-American Engineering Committee.

The following were appointed representatives: F. Lavis, C. Davis, B. Creson, P. Henry and E. Marburg.

COMPARATIVE COST OF FRAME AND TILE

Nothing seems to be of such absorbing interest to the builder as the matter of cost. It is of vital importance whether the building is a small residence or a large structure running into a cost of thousands of dollars.

A very interesting instance of comparative cost of a tile and frame house was recently furnished by an occurrence in Dallas, Tex.

R. E. Rigg, a contractor of that city, secured the contract for a six-room frame bungalow, the figure being $3,020.00.

After the contract was signed, the owner became convinced that he wanted to use interlocking tile, notwithstanding the fact that the contractor had the signed contract and could charge practically any price he desired for extras. He went over the plans carefully and found that for $3,170.00 he could build exactly the same house of interlocking tile with stucco exterior. The change was made accordingly and the builder secured a fireproof interlocking tile home for only $150 more than he would have paid for the frame home.

WATCH IT GROW

The 1916 *record of fire losses!*

What does it indicate?

Stupidity, cupidity, culpability, niggardliness — the result of the "penny-wise and pound-foolish" policy—lack of knowledge on the part of those who ought to know what constitutes a consistent fire-safe building, be it home, office or factory.

How can these things be learned?

By studying CONSTRVCTION!

R. P. MILLER CHOSEN BUILDING EXPERT

Rudolph P. Miller, formerly Superintendent of Buildings of the Borough of Manhattan, New York, has been retained by the Board of Aldermen as expert on buildings to assist the Committee on Ordinances to complete the Building Code for the city. The term of service will be six months. The matter in hand is the standardization of theater construction.

It will be recalled that Mr. Miller supervised the revision of the entire Building Code, giving up his position as Superintendent of Buildings in Manhattan to undertake the work.

FIRESAFETY FOR INDUSTRIAL PLANTS

Report comes from the Johns-Manville Company to the effect that a large manufacturing concern producing amongst other articles war munitions at the rate of 10,000,000 shells per annum, in seeking to fortify itself against the spread of fire, has established an up-to-date department especially for the purpose of fire prevention. Efficient fire-fighting apparatus has been installed, and the department is under the supervision of an ex-fire captain, while the majority of the men under him have seen active service in city fire departments. This concern, in following out such a commendable programme, is certainly seeing to it that the door is locked and bolted *before* the well-known nag slips his halter and makes a get-away. Hundreds of factories all over the country, many of them veritable tinder boxes, would do well to take this example to heart and spend a few dollars to save thousands. There are sprinkler systems and extinguishers galore, which, in the event of fire, would prove themselves worth their weight in gold. One concern in a near-by State has recently scattered over 1,000 extinguishers throughout its plant. But there will ever be more fools than wise men, even among business executives, and the chances are that any paper of to-morrow will relate the tale of some factory being gutted—same old story, combustible construction, no fire-fighting devices, and a few more people who have learned the bitter lesson too late.

GEORGE T. MORTIMER NEW HEAD OF EQUITABLE BUILDING ORGANIZATION

George T. Mortimer, recently elected president of the Equitable Office Building Corporation, New York city, to succeed General du Pont, is familiar with the hard work and self-denial which are the foundations of real knowledge and achievement. He began his business life at the very bottom rung, hanging up "To Let" signs.

for a real estate firm. It is a dizzy climb from such lowly and humble work to the executive duties of president of the company owning the largest office building in the world—The Equitable Building—but by the power of ceaseless endeavor, joined with an inquiring mind and natural business ability, Mr. Mortimer progressed. He was at one time employed on the New York *World* as a reporter, where he got his first knowledge of real estate. Before his thirtieth year he was in the service of the United States Realty Company, where for five years, as vice-president, he managed that concern, having under his charge such well-known buildings as the Whitehall, Trinity, Flatiron, United States Realty, Mercantile and the Everett. At the age of forty he has attained the highest honor in the realm of building management, the presidency of not only the *largest* office structure in the world, but one of the most consistently constructed *firesafe* buildings as well; for in point of real fire safety, The Equitable represents mankind's most advanced engineering knowledge as how best to prevent fire—by properly using standard firesafe materials and devices. Mr. Mortimer's salary equals that of a metropolitan bank president. His career offers further proof of the value of the old saying, known by wise men to be true and joked at by fools, that "there is no fun like hard work." "Blessed is the man who has found his work."

THE MODEL FARMHOUSE

Unique Movement for Exploiting Wisconsin Building Materials

Dean H. L. Russell, of the College of Agriculture, University of Wisconsin, has just issued an announcement that a movement is to be commenced which will result in the erection upon the college campus of a model farmhouse constructed entirely of Wisconsin products.

This movement presents a genuine opportunity of no small measure to those interested in Wisconsin materials to get the virtues of their products before the college.

Thoroughly aware of the chance thus presented to feature the product back of his association, Secretary S. Weidman, of the Wisconsin Clay Manufacturers' Association, sent the following letter to Dean Russell:

"I note from a recent announcement that you are planning to erect a model farmhouse in which nothing but Wisconsin products will be used. A model farm home will be a very useful and instructive addition to the college campus and I hope that you will be successful in carrying out your plans.

"As secretary of the Wisconsin Clay Manufacturers' Association, I wish to call your attention to the fact that Wisconsin brick would be a most suitable building material for the exterior walls of such a model house, not only because brick is fireproof, but because, considering the average life of a building and the cost of upkeep, a brick house is cheaper in the end than one of frame. A model farm home built of Wisconsin buff or red brick, with a mortar joint of Wisconsin magnesia lime, would furnish a much-needed and far better example to the farmers of the State, as showing the application of art to home-building, than would be if such a home were built of wood.

"Wisconsin brick yards produce a good grade of common brick, with a wide range of colors from white or cream, through various shades to deep red. Good brick suitable for your purpose could be obtained for from seven to eight dollars per thousand, and if you should select the brick, I think the required amount for a $3,000 house would be furnished gratis from any of the brick yards of Wisconsin."

The preliminary plans proposed by the college call for a house built of hemlock and trimmed with brick. These specifications are only tentative. The house is intended to serve as a model of such a home as is within the reach of the average farmer. It is to be up-to-date in every respect and to contain all the conveniences of a home in the city.

◆

Discontent may be a very good thing, or a very bad. There is a discontent that is divine; that has its birth in the highest and purest inspiration that visits the soul. All the discontent which grows from dissatisfaction with present attainments, or springs from a desire for higher usefulness, or that impels to the worthy achievement of an honorable name or place, is a noble discontent and to be visited with blessings. But the discontent which comes from below—from a soul disgusted with its lot and faithless to our best instincts, and out of harmony with the arrangements and operations of Providence, is evil, and only evil continually. One tends to the development of a symmetrical, strong and harmonious character; the other to an evil temper and a complaining spirit and a rebellious heart. One is of heaven; the other of hell.

FIGHTING FIRE WITH MOVING PICTURES

That the motion-picture machine is being most serviceably utilized in spreading knowledge of the danger of fire and how to prevent it is shown by the unique way in which the "movies" are featured by the New York Central Railroad.

Marcus A. Dow, general safety agent for the road, is the author and producer of "Steve Hill's Awakening" and "The House that Jack Built," two railroad safety films brought out to educate employees of the Central Lines to the need of fire prevention.

These reels have been shown all over the country to railroad men and their families, the former being required to take time to see the pictures and learn the lessons in safety revealed in the intensely interesting and instructive scenes.

The ready willingness of the Central executives to make the programme of safety worth while and realistic is shown in the fact that they arranged a real rear-end collision between a big freight locomotive drawing a heavy line of cars and another train. In the crash a coach and two other cars are completely demolished.

"Steve Hill's Awakening," the first motion picture developed by Mr. Dow, has been shown before between three to four million persons, mainly railroad men. Over a hundred thousand New York Central employees witnessed it, and many other companies have subscribed for the reels in order to exhibit them before their men. Several railroad companies are arranging to obtain copies of "The House that Jack Built." They will fit up movie cars and run the picture all over the various lines.

CERAMIC SOCIETY ELECTS NEW OFFICERS

The meeting of the American Ceramic Society, recently held at Cleveland, was conducted by R. R. Hice, of Beaver, Pa., president; R. T. Stull, of Conneaut, Ohio, vice-president; Edward Orton, Jr., of Columbus, Ohio, secretary; Herford Hope, of Beaver Falls, Pa., treasurer, and the trustees, F. W. Walker, of Beaver Falls, Pa.; G. H. Brown, of Pittsburgh, Pa., and H. F. Staley, of Ames, Iowa. The following were elected to office at the close of the meeting and are in service this year:

L. E. Barringer, of Schenectady, N. Y., president; F. K. Pence, of Zanesville, Ohio, vice-president; Edward Orton, Jr., of Columbus, Ohio, secretary; Herford Hope, of Beaver Falls, Pa., treasurer; G. H. Brown, of Pittsburgh, Pa.; H. F. Staley, of Ames, Iowa, and A. F. Hottinger, of Chicago, trustees.

The following were elected to active membership: M. F. Beecher, The Norton Company, Worcester, Mass.; D. E. Humphrey, The Medal Brick Company, Cleveland, Ohio; C. S. Kinnison, "The Brick Maker," Pittsburgh, Pa.; R. J. Montgomery, The H. Koppers Company, Pittsburgh, Pa.; A. Silverman, University of Pittsburgh, Pittsburgh, Pa.; Wilber Stout, Ohio Geological Survey, Columbus, Ohio; Paul Teetor, Kansas Geological Survey, Lawrence, Kans.; A. E. Williams, University of Illinois, Urbana, Ill., and Ira C. Williams, Oregon Bureau of Mines, Corvallis, Ore.

Nine associate members were nominated for promotion to active membership. Their names will be voted on by ballot at the next annual meeting. These men were: Walter A. Denmead, General Electric Company, Research Department, Schenectady, N. Y.; Carl B. Harrop, Ohio State University, Columbus, Ohio; Herbert B. Henderson, Edward Orton Company, Pyrometric Cone Factory, Columbus, Ohio; Ercill C. Hill, New York Architectural Terra Cotta Company, Long Island City, N. Y.; W. L. Howard, U. S. Bureau of Standards, Pittsburgh, Pa.; Chas. J. Kirk, Universal Sanitary Manufacturing Company, New Castle, Pa.; Emerison P. Poste, Elyria Enameled Products Company, Elyria, Ohio; J. W. Ward, Pittsburgh High Voltage Insulator Company, Derry, Pa.; F. W. Walker, Jr., Beaver Falls Art Tile Company, Beaver Falls, Pa. An unusually large number of ceramists were elected to associate membership, including two Japanese ceramists.

The total membership, February 1, 1916, which is the beginning of the fiscal year, was 510, indicating a gain in membership of 33.

The attendance was 150, which is the highest record for the American Ceramic Society.

Fifty-one papers were read during the sessions, which lasted from February 21 to 24, and sections "Q" were held at intervals.

The A. C. S. "Transactions"

Members of the American Ceramic Society know all about the "Transactions"—a yearly volume of the papers read at the meetings of this, the most influential ceramists' organization in the world.

A complete set of these volumes (there are seventeen) would give their possessor far and away the most complete line of ceramic data printed in the English language. The cost of the complete set, by the way, is $94.25, if the cloth-bound books are desired.

The most recent volume, of which Arthur S. Watts was the editor, is known as Volume XVII, and has 813 pages, filled to the type margin with valuable matter for everyone interested, even remotely, in any branch of clay-working.

EDWARD E. CROKER WITH PYRENE MFG. COMPANY

The Pyrene Manufacturing Company, makers of the well-known Pyrene fire extinguisher, has strengthened its engineering staff by securing the services of Edward F. Croker, Jr., the son of the famous New York city ex-fire chief. Mr. Croker is thoroughly familiar with modern fire-fighting methods and will, of course, bring this valuable knowledge to bear in the interests of the Pyrene business.

Do Not Delay Building

Conditions for building never will be more favorable than at the present time.

Let your dream of that Safe Home be realized this year.

We sell every material for the Fire Resistive Building.

Service the best.

Cuyahoga Builders' Supply Company

SCHOFIELD BUILDING **CLEVELAND, OHIO**

REYNOLDS

FIRE SAFE

APPROVED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS
TRADE MARK
H.M.R.
ESTABLISHED 1868

SHINGLES

TESTED by the Underwriters laboratories under their standard tests, Reynolds Shingles have proven themselves worthy of classification as fire preventatives.

Reynolds Shingles have a top surfacing of granulated slate, granite, etc., and they positively will not ignite from flying sparks or brands. Where fire originates inside the building they have a marked blanketing influence.

We call them "Safety First" because they protect from rain or storms, from heat or cold and from the common agencies which spread fire.

Reynolds Shingles are the standard asphalt Shingles and you will make no mistake in insisting on Reynolds Shingles.

If your dealer cannot supply you write the factory.

H. M. Reynolds Asphalt Shingle Co.
"Originators of the Asphalt Shingle"
Grand Rapids MICHIGAN

One-half of a Brick

is Service

You not only need brick for your Building Operation but you must have them when you want them.
We have anticipated the demands of a growing city.
Every year we increase our output and our service equipment.
We are now prepared for 1916 BUSINESS.

The Farr Brick Co.

Leader-News Bldg., Cleveland

Your Home is Known by the Company it Keeps

The selection of a site is all important.

When you buy, rent or sell real estate of any kind our services will help.

Our three offices offer unusual facilities to every client.

GENERAL REAL ESTATE

THE ONELLY CO.

Main Office:
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CLEVELAND, OHIO

BRANCHES:
East Cleveland, 13592 Euclid Avenue
Lakewood, Corner Belle & Detroit Ave.

WHY YOU MAKE NO MISTAKE BY USING "TRUSS-LOOP" LATH

THE FIRE PROTECTION IS EFFICIENT
YOUR WALLS, CEILINGS AND PARTITIONS ARE VERMIN PROOF.

ON ACCOUNT OF ITS EXTREME WEIGHT (5 LBS. PER SQ. YD.), YOU SECURE THE MOST RIGID CONSTRUCTION

YOU ARE PERMANENTLY PROTECTED AGAINST FALLING PLASTER

YOU ARE ASSURED THE LOWEST FINISHED COST.

The Bostwick Steel Lath Co., NILES, OHIO.

She: "If we must cut down expenses, why not drop your life insurance?"
He: "Not much. That's *your* insurance, not mine. I figure we can trim about all the other items so as to save at least $400 a year, and I'm going to take a hundred of that and buy another Postal policy while I can get it. You and the kiddies may be glad some day."
She: (thoughtfully) "I guess you're right at that, Jim."

Put Life Insurance in Your Family Budget —and Keep It There

THE *real* husband always makes a liberal allowance for life-insurance whether his wife wants him to or not, but the sensible woman *does* want him to when she considers it seriously.

And whether times are hard or easy they both want the most protection possible for their money, and hundreds of them during the last decade have therefore been turning to the

POSTAL LIFE INSURANCE COMPANY

The Postal employs no agents but issues its policies direct. Agents' commissions and office-expenses are thus saved and go to its policyholders.

It is not alone the Company of Safety and Service but also of Saving, for you will find net cost low—lower than ever before—because the Postal's actual underwriting experience has enabled it now to make a

10% reduction in premium rates with a continuance of the annual guaranteed dividend of **9½%**

Besides these savings, the Company pays the usual contingent dividends, depending on earnings.

If you are in good health you should take advantage of the 10% reduction in premium-rates and other Postal economies.

Find Out How Much *You* Can Save At Your Age

on any standard form of Policy—Whole-Life, Limited-Payment Life, Endowment, Joint Life, or on a Monthly Income Contract.

The Postal issues all of the standard forms, and operates under the strict supervision of the New York State Insurance Department and is subject to the United States Postal authorities.

To get exact figures for your age, simply fill out the coupon and mail today.

Remember: No agent will be sent to visit you. The Postal Life employs no agents; resultant commission-savings go to *you* because you deal *direct*.

POSTAL LIFE INSURANCE COMPANY
WM. R. MALONE PRESIDENT
THIRTY-FIVE NASSAU STREET NEW YORK

Constrvction, April
Postal Life Insurance Company
35 Nassau St., N. Y.

Without obligating me, please send full insurance particulars for my age.

Name ....

Address ....

....

Occupation ....

Exact date of birth ....

Main Lobby: Cleveland Athletic Club. Finished in Excelsior Caen Stone Cement. F. Milton Dyer, *Architect*

Artistic Walls
Need Not Be Expensive

The low cost of itself is no recommendation but consider the artistic and unusual effects and the wide range of interior decoration made possible by

Excelsior
Caen Stone Cement

In appearance it cannot be distinguished from the genuine Caen Stone of France. It has the same restful buff tone and the same feeling.
Yet Excelsior Caen Stone can be applied to any interior surface as readily as plaster and at a cost only slightly greater.

Catalog in Sweet's **Ask for sample panels**

The Cleveland Builders' Supply Co.
Cleveland, Ohio

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BARKWILL BRICK CO.
BRICK and TILE

MADE RIGHT
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DELIVERED RIGHT

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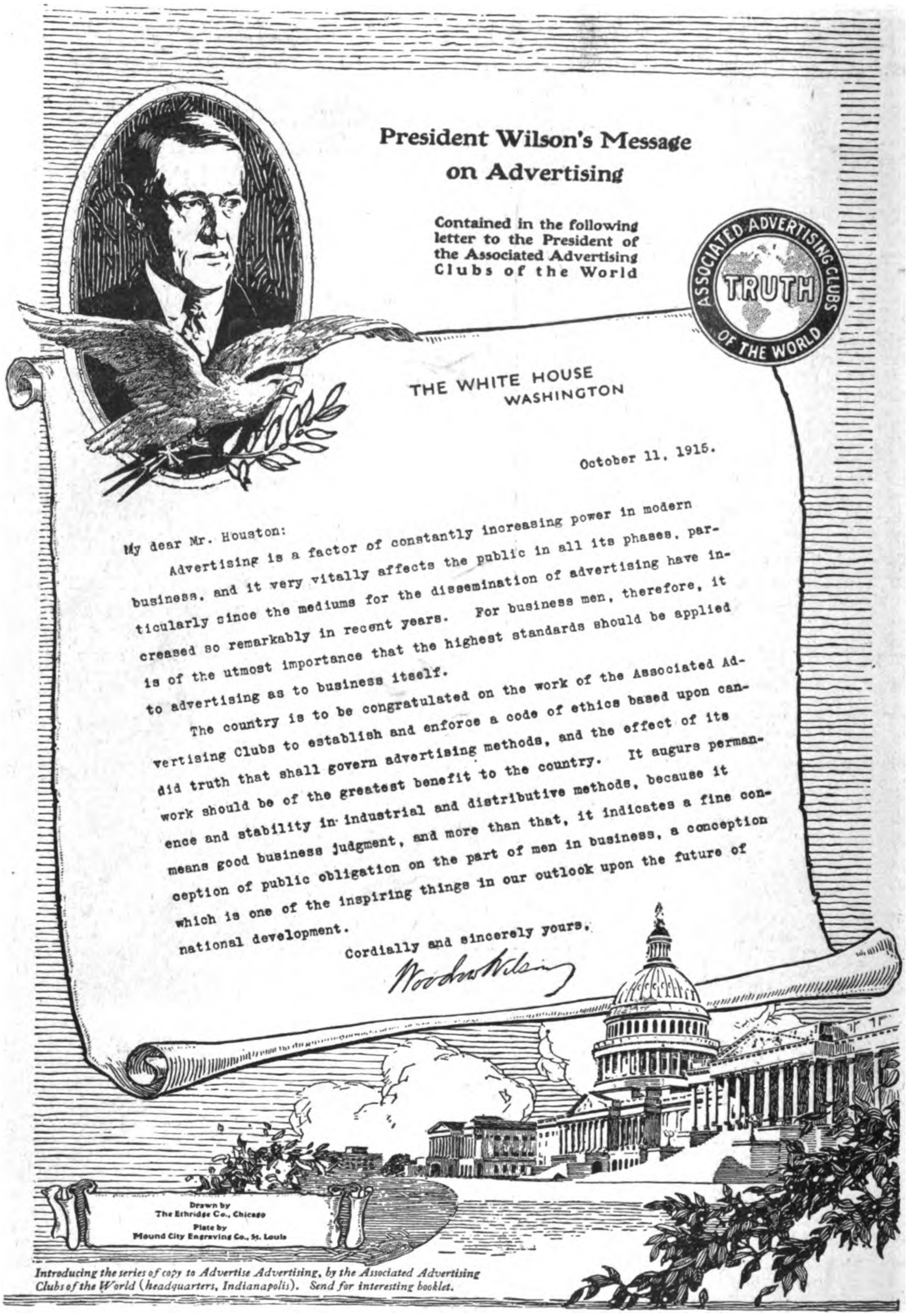
OF NEW YORK
220 East 138th Street



President Wilson's Message on Advertising

Contained in the following letter to the President of the Associated Advertising Clubs of the World

THE WHITE HOUSE
WASHINGTON

October 11, 1915.

My dear Mr. Houston:

Advertising is a factor of constantly increasing power in modern business, and it very vitally affects the public in all its phases, particularly since the mediums for the dissemination of advertising have increased so remarkably in recent years. For business men, therefore, it is of the utmost importance that the highest standards should be applied to advertising as to business itself.

The country is to be congratulated on the work of the Associated Advertising Clubs to establish and enforce a code of ethics based upon candid truth that shall govern advertising methods, and the effect of its work should be of the greatest benefit to the country. It augurs permanence and stability in industrial and distributive methods, because it means good business judgment, and more than that, it indicates a fine conception of public obligation on the part of men in business, a conception which is one of the inspiring things in our outlook upon the future of national development.

Cordially and sincerely yours,

Woodrow Wilson

Drawn by
The Ethridge Co., Chicago
Plate by
Mound City Engraving Co., St. Louis

Introducing the series of copy to Advertise Advertising, by the Associated Advertising Clubs of the World (headquarters, Indianapolis). Send for interesting booklet.

JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT

Serves More People in More Ways than any other Institution of Its kind in the World.

Residence of J. A. Curry Portland, Ore.

A Shingle Roof that is a Protection—not a Risk

If your neighbor's house took fire, would your roof save your home from possible destruction? Flying sparks and fire brands are a real menace. Safety and economy argue for

JOHNS-MANVILLE
Transite Asbestos Shingles
Fire-Proof and Everlasting

Made from two incombustible and practically indestructible materials—Asbestos fibre and Portland Cement.

Afford positive fire and weather protection with the base rate of insurance—all at a cost little more than ordinary wooden shingles—no higher than tile or slate, and with no cost of upkeep.

Supplied in a variety of shapes, sizes and colors to meet every artistic requirement. Your carpenter, roofer or slater can lay them and your continued satisfaction is definitely assured by

J-M Roofing Responsibility

We offer you the privilege of registering your J-M Roofing with us. When you do so, you say, "Here is my roofing—look after it for me." This is precisely what we will do and are doing, to make sure of your and every J-M Roofing user's continuous satisfaction.

J-M Transite Asbestos Shingles are examined, approved and labeled by the Underwriters' Laboratories, Inc., under the direction of the National Board of Fire Underwriters.

H. W. Johns-Manville Co.

Boston
New York
Chicago
Philadelphia
Cleveland
Pittsburgh
St. Louis
Milwaukee
San Francisco

POMEROY FIRE RETARDANT WINDOWS

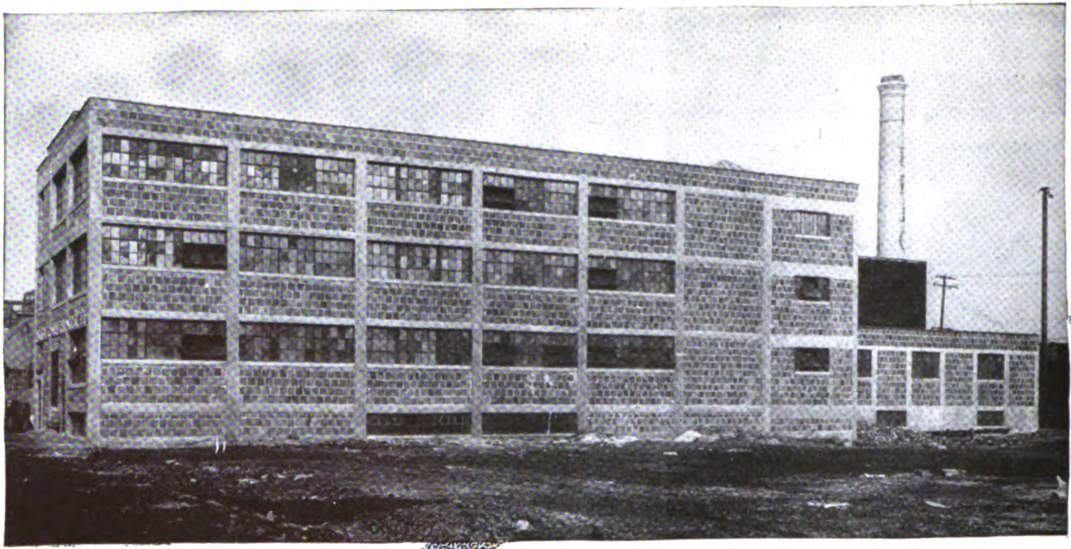
Not Made to Meet a Price, but to Set a Standard of Service

GENERATIONS of struggle with hard-working, back-breaking, temper-destroying windows have left so vivid an imprint upon mankind, that today no one approaches a window—to open or close it—without the subconscious anticipation of a more-or-less exhausting encounter with the Window Demon. Why? Simply because—"since the memory of man runneth not to the contrary"—the average manufacturer of windows has not found it worthwhile, or profitable, to make an efficient window. For—in window lore—"efficient" means "easily operated and at the same time of good weathering qualities." We here venture to assert that every **Pomeroy** Window is an efficient window.

Ask Us To Show How and Why

SAMPLES FILED WITH ARCHITECTS SAMPLES CO NEW YORK CITY

S. H. POMEROY COMPANY, INC.
30 EAST 42ND STREET NEW YORK



*Factory of the Jones Chemical Co., Jersey City, N. J.
Fletcher-Thompson Co., Engineers
Smooth face Natco XXX Hollow Tile used in curtain walls.*

Factory erected by National Fire Proofing Company.

Strictly Business!

"Hold down the cost—give us maximum strength for minimum weight—keep the building dry and sanitary—with plenty of light—hold down the heating bills in winter and keep it cool in summer—and make it absolutely fireproof!"

To meet demands like these requires engineering skill and architectural knowledge of top notch calibre.

Yet they are the demands made by factory owners all over the country—met completely by

NATCO·HOLLOW·TILE

Natco is a scientific building material made for a definite purpose, and available for all types of buildings from small dwellings to skyscrapers. Scientific builders and engineers know all about the way it delivers the goods in actual performance.

Take this big factory for the Jones Chemical Company. Maximum efficiency—minimum expense. Cheaper than solid reinforced concrete or brick. It's a soap factory, by the way—with none of the usual condensation on the exterior walls.

Your engineering problem—how will Natco help you to solve it? Drop us a line and let us send you the literature that fits your case. Your knowledge of science is your stock in trade.

Here is science in a modern building material—very much at your service.

Think of Natco as a service free to engineers, architects and contractors for the economical and efficient solution of all building problems.

The Jones Chemical Co. factory is not only constructed of Natco Hollow Tile but it was erected by us.

NATIONAL·FIRE·PROOFING·COMPANY
380 FEDERAL STREET, PITTSBURGH, PA.

Other Offices:
New York Boston Philadelphia Washington Chicago Canton
Detroit Toronto, Ontario, Canada Syracuse

23 factories in the United States, and also at Hamilton, Ontario, Canada

OFFICIAL JOURNAL OF SOCIETY ADVOCATING FIRE ELIMINATION

CONSTRVCTION

WITH A

DEPARTMENT DEVOTED TO

SAFE HOMES

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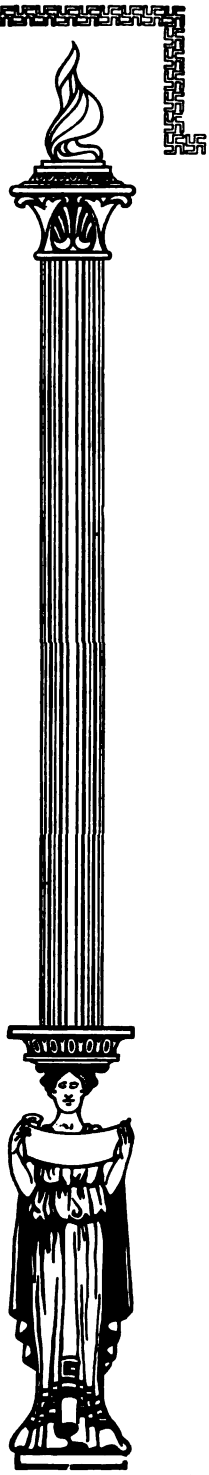

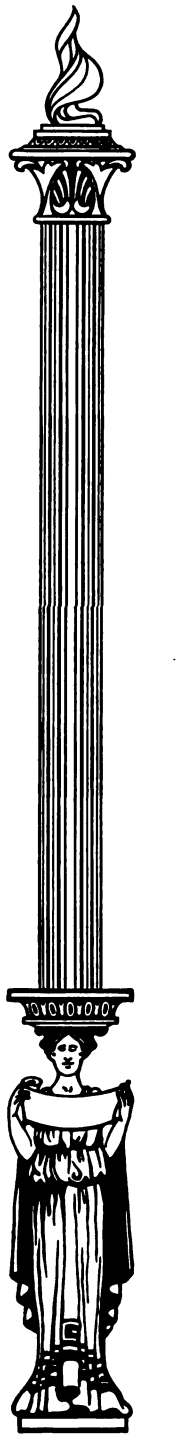

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PROTECTING BUILDING EXTERIORS AGAINST COMMUNICATED FIRES 267-296

A comprehensive article on "How to Properly Safeguard Against a Hazard Responsible for Fully Sixty Per Cent of the Annual Fire Loss."

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BUILDING CODES AND ORDINANCES.
RECENT BUILDING PROJECTS.

SAFE HOMES....302-308

Brick Homes at Low Cost.

Examples of attractive houses and contract figures at which they can be built.

THE FIREPROOFING NEWS....309-316

A new department containing up-to-the-minute news of new devices and applications of materials—also news of interest to the fireproofing industries.

Entered as second-class matter November 3, 1915, at the post office at New York, New York, under the Act of March 3, 1879.

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SUBSCRIPTION PRICE—TWO DOLLARS THE YEAR IN U. S. A.

The Recent $5,000,000 Fire at Augusta, Ga.

again proves conclusively thefallacy of building with combustible materials. A fire of such large proportions, as well as those totaling smaller losses, which occur daily, exemplify the necessity of constructing all buildings with fireproof materials. Especially since this can be accomplished with

BERGER'S

Metal Lumber

(PATENTED)

at a cost practically the same as with wood lumber. This modern structural material is adapted to any building—large or small—and any climate. Official, practical fire, load and water tests have proven it to be absolutely fireproof and indestructible. It is also proof against earthquakes, sound, dampness and rodents.

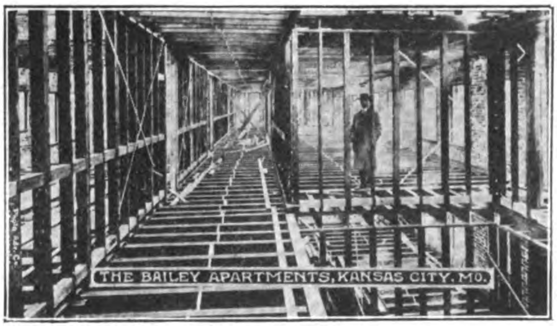
Made from a special analysis, heat-treated, double-grained steel, which is responsible for its exceptional strength and durability. Ecah unit is cut and numbered to suit building plans, making erection as quickly as with wood and quicker than reinforced concrete, while the cost of construction is moderate as compared with other classes of fireproof material.

For safety, durability and economy, use Berger's Metal Lumber for your buildings.

Write for illustrated and descriptive catalog L. C. and Fire Test Bulletin.

I. Joist

The Berger Manufacturing Co.
Canton, Ohio
Branches: Boston New York Philadelphia Chicago
St. Louis Minnespolis San Francisco
Export Dept. Berger Bldg., New York City, U. S. A.



Showing Berger's Metal Lumber Construction.
Architect: Otis Goddard, Kansas City, Mo.

"The Largest Fire Insurance Company in America"

ORGANIZED 1853

ELBRIDGE G. SNOW, President

"Service" in Fire Insurance

Fire Insurance, as issued by THE HOME INSURANCE COMPANY OF NEW YORK, means something more than Indemnity for Loss or Damage due to Fire and other causes.

It means a "SERVICE" to Policyholders which is unexcelled. The Company's equipment includes:

1. **Experts in every branch at its Head Office and in the Field.**
2. **Agents throughout the United States and its possessions, and in Canada, to write Policies.**
3. **Complete facilities for the Prompt Adjustment of Losses.**

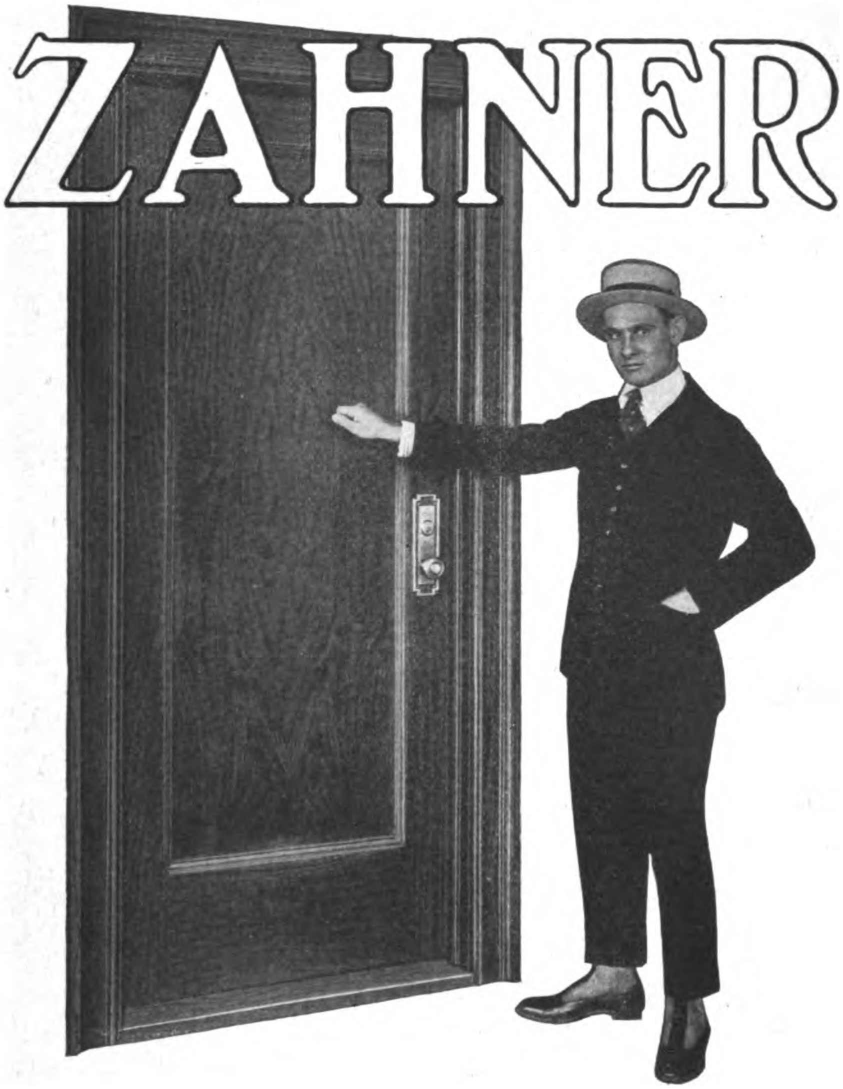
The advice which may be had gratis from the Department of Improved Risks, located at the Head Office, will be found especially valuable to large insurers.

Ask any "HOME OF NEW YORK" Agent, or address inquiry to Department of Improved Risks, 56 Cedar Street, New York City.

ALL BRANCHES OF FIRE INSURANCE

Automobiles, Commissions, Hail, Marine (Inland and Ocean), Parcel Post, Profits, Registered Mail, Rents, Sprinkler Leakage, Tourists' Baggage, Use and Occupancy, Windstorm.

STRENGTH · REPUTATION SERVICE



Is It *Wood* or *Steel?*

It is *wood* in appearance, but *steel* in construction and durability.

The finish of a ZAHNER Welded Steel Door resembles the actual wood (mahogany, circassian walnut, etc., as the case may be), so closely that it is impossible to tell that the door is make of steel even by rapping upon it, so perfect is the ZAHNER sound-deadening system.

Write for samples and for any other information desired.

THE ZAHNER METAL SASH AND DOOR CO.
CANTON
THE CITY OF DIVERSIFIED INDUSTRIES

"Build it of Standard Products —Make it Consistently Firesafe"

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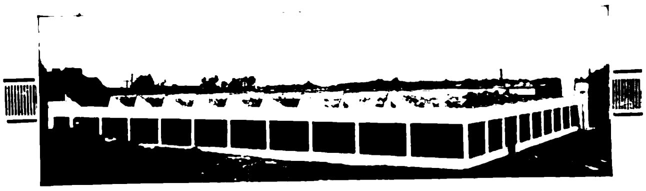

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EVANS "ALMETL" FIRE DOORS

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APPROVED BY UNDERWRITERS' LABORATORIES, CHICAGO

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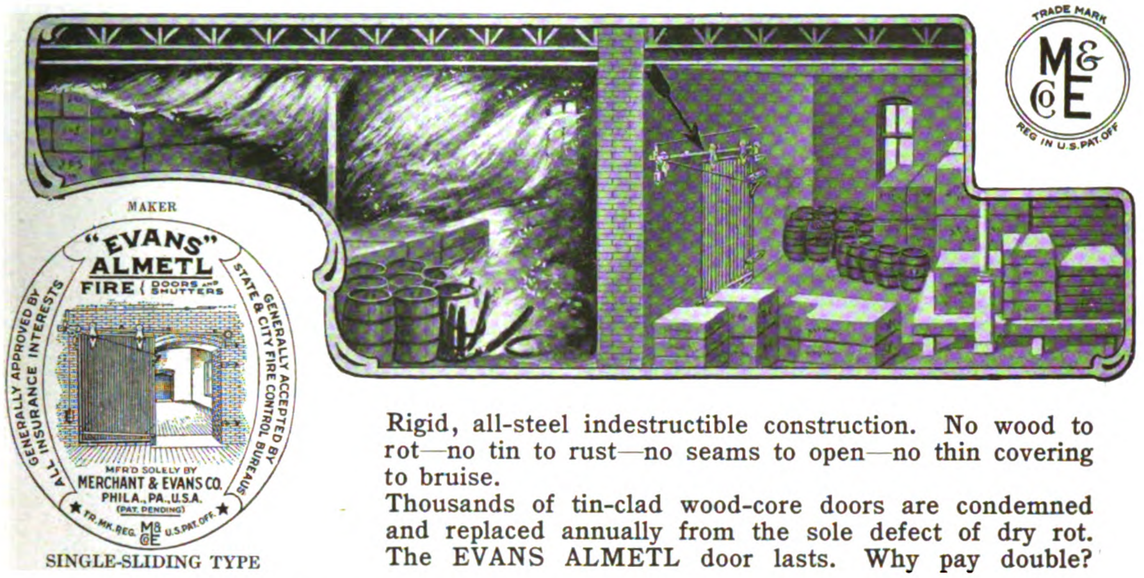
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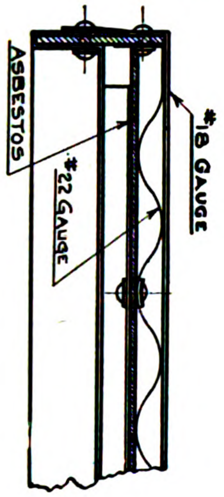
SINGLE-SLIDING TYPE

Rigid, all-steel indestructible construction. No wood to rot—no tin to rust—no seams to open—no thin covering to bruise.

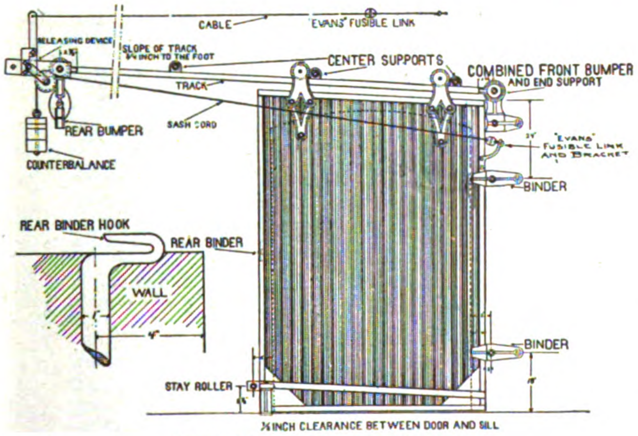
Thousands of tin-clad wood-core doors are condemned and replaced annually from the sole defect of dry rot. The EVANS ALMETL door lasts. Why pay double?

NOTE—THE HEAVY 18-GAUGE BINDER PREVENTS DAMAGE AND DOOR LASTS!



DESCRIPTION

A panel of standard 2½-inch corrugated 22 gauge galvanized steel interlined with $^{1}/_{8}$-inch asbestos in a rigid frame of continuous $^{3}/_{16}$ by 2½-inch bar iron. Frame bound in a cover of 18 gauge galvanized steel forming a box for the panel and taking the abuse on the edge of door. Heavy corner gusset plates to prevent any sagging. Provision for expansion and contraction without distorting. The large heavy cross-laid corrugations give extreme strength while omission of the heavy wood core gives one-third lighter weight than ordinary doors. The large air spaces in the corrugations supplementing the thick asbestos give maximum resistance to heat. Thoroughly tested in actual service up to 8-feet by 10-feet openings.



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The Mesh that makes the plaster stick.

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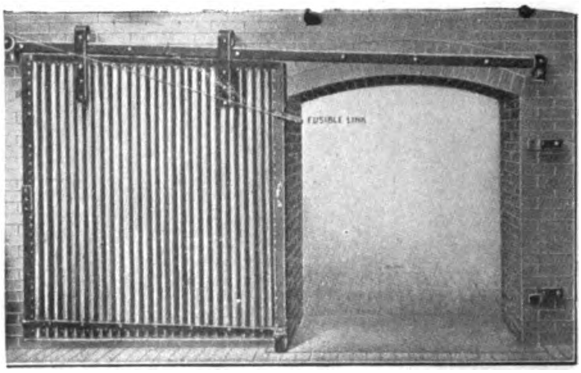
Labeled by Underwriters' Laboratories.



Saino All-Metal Fire Doors and Shutters

Light, Rigid, Indestructible! Built for daily use. No wood to rot; no tin to rust; no repairs. Seventeen years without a replacement from fire, rust or rot.

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BROOKLYN CHICAGO MEMPHIS, TENN.

If you are a Manufacturer *of* Firesafe Material or Protective Devices,

consistent presentation—in season and out—of your product in CONSTRVCTION cannot fail to result favorably because the success of this publication depends upon

(1) how well it advances and proves the argument for proper fireproofing and

(2) what it actually accomplishes to increase the use of firesafe materials and devices.

The first objective is attained (intensively) through the editorial, news and advertising sections of CONSTRVCTION and (extensively) by sending the magazine over the entire country to all the business and professional interests related to building planning, construction, equipment and maintenance.

The second purpose is accomplished by *actively fighting for legislation favoring firesafe construction* and against laws permitting the continued use of wood——and remember that no company can do this work as effectively as a publication, that the "fireproofing fraternity" at present is a composite unorganized body comprising a number of separate units representing more than a dozen industries, that there is practical need of a national mouthpiece such as you have in CONSTRVCTION, that *makers of fireproof materials are now getting but one per cent of the business which ought to be theirs,* that advertising in CONSTRVCTION is helping yourself to get more orders, giving your goods the representation they deserve—and according this publication the co-operation it merits.

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Close These Doors

—and each room immediately becomes a segregated unit—fireproof and firesafe. Dahlstrom Metallic Doors and Trim provide the convenience of communication in office suites to the exclusion of all fire hazard. Apart from wear-proof and fire-proof service they also contribute to the aesthetic requirements of the fine building. The baked-on enamel finish is equal in appearance to the finest woods from the view point of both grain and coloring. This finish is also elastic, sanitary and easily cleaned. Write for all the facts.

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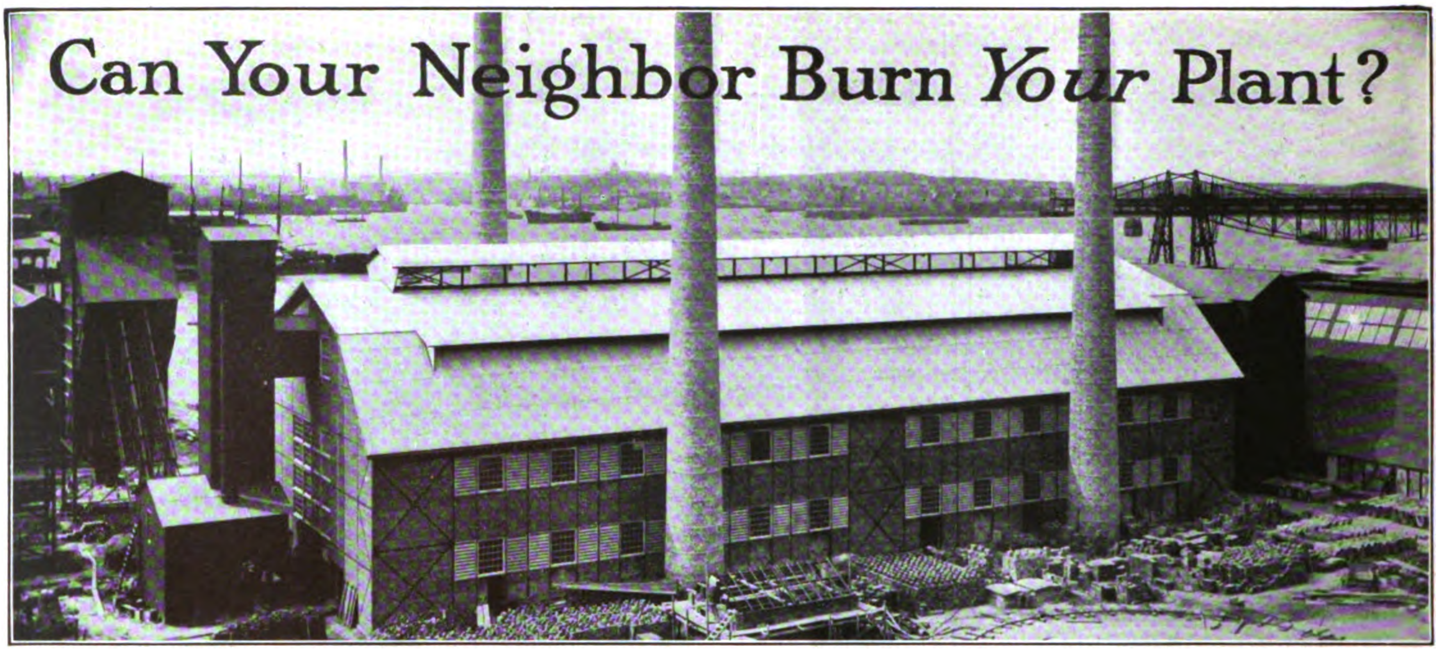

CAN flying sparks or burning brands from fire in an adjoining plant set *your* roof in flames—or will heat radiating from nearby fire damage your building or equipment?

Can the scorching summer sun—the tight freezes of severe winters—the sharp fall winds—the heavy spring rains—heavy falls of snow—can these things injure your roof? Does your roof show signs of wear and deterioration from year to year? Are you digging into your profits to pay paint bills—repair bills and perhaps even an occasional re-roofing?

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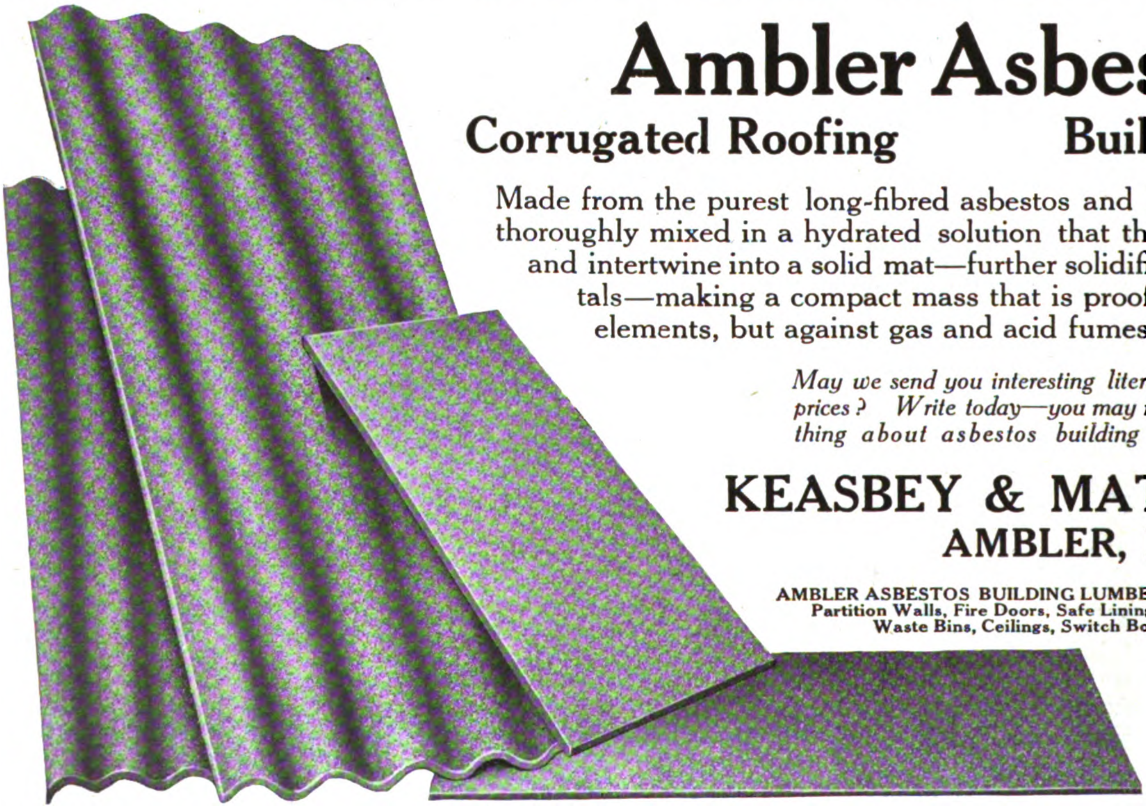

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CONSTRUCTION

WITH A DEPARTMENT DEVOTED TO

SAFE HOMES

VOL. II MAY, 1916 No. 5

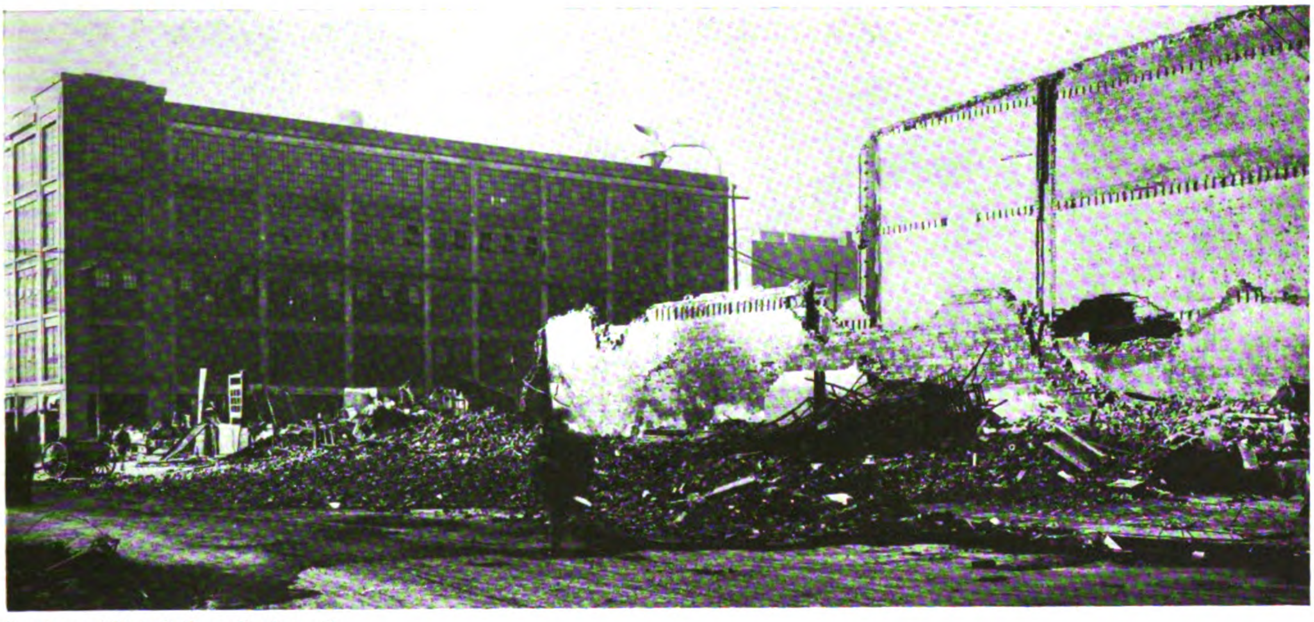
Protecting Building Exteriors Against Communicated Fires

Approximately 60% of the $250,000,000 National Annual Fire Loss is Due to Communicated Fires. Protection Against Exterior Exposures is a Subject Which Should be of Vital Interest to Those who Contemplate the Construction of New Buildings of Any Type.

RECENT great conflagrations in the South have served to emphasize and clearly demonstrate the fact that one of the most important problems in building construction is that of guarding the building against the entrance of flames which might be communicated from nearby fires or sweeping conflagrations.

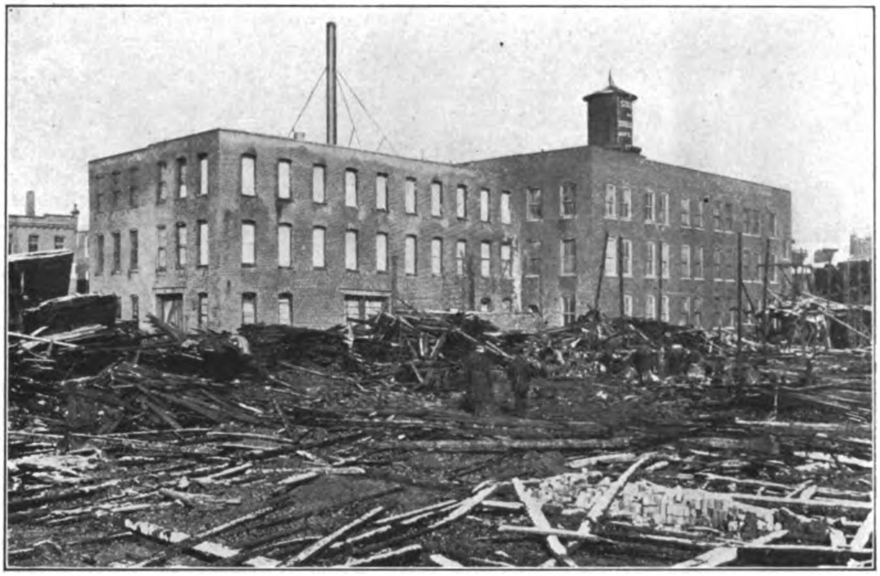
This means simply that no matter how carefully the interior of a building is constructed it must necessarily partake of the potential fire hazard of surrounding buildings, and that every part of the building exterior must be equally fire-resisting; that is, the roof and exterior opening must be so constructed and so protected against exposures that fire cannot enter any more readily than it would through the masonry walls.

At first thought, it would seem that the danger of communicated fires would not be as severe in buildings of masonry construction as that of interior fires; but experience has not only proven the contrary condition to exist, but has shown clearly that both exterior and interior exposures must be guarded against to ob-



Courtesy of Detroit Steel Products Co.

A blaze which completely destroyed an inconsistently constructed building constituted an extremely severe exposure fire which would have gutted the factory in the background had it not been for the splendid protection afforded by wire glass in solid steel sash



Courtesy of Mississippi Wire Glass Co.

A striking example of the value of proper protection against an exposure. Note two buildings, one protected by wire glass in metal frames, the other unprotected. In the first building business was resumed the next day—the second was gutted by fire

STAUDTE & RUECKHOLDT MFG. CO.

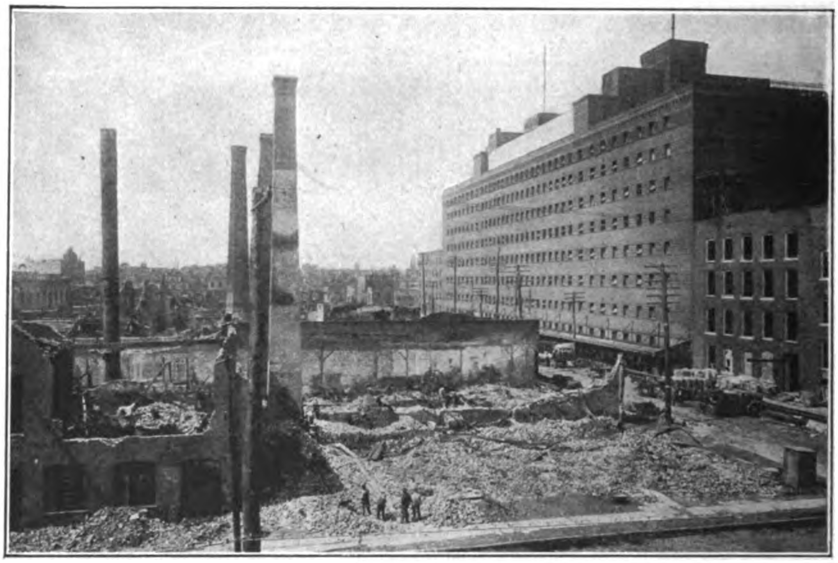
(Lumber yard burned)

tain that degree of immunity from the great direct, and still greater indirect loss, incident to fire in buildings of any type.

Architects, builders and property owners have in the past and are to-day giving far too little thought to this matter of protection against exposures; and particularly the question of exterior openings. Nowhere in the world will be found such combinations of bad exposures and negligible protection as may be found in any of the cities, large or small, in this country to-day. It is almost impossible to select a site for the erection of any type of building, from a home to a great office or mercantile structure, without encountering immediately the problem of serious exposures. And is this problem generally recognized? Does the architect or the owner realize the continually existing danger of fires communicating from other buildings? Is it generally realized that of a building's entire fire rsk, that from within the building, on the average, is estimated at 40 per cent, the other 60 per cent of the risk being from fires from without?

It would seem not, if one judges by the hundreds

Wire glass in proper metal frames saved the Butler Bros. Building, Jersey City, N. J., August 17, 1910. from the severe exposure fire shown in this photograph



Courtesy of Mississippi Wire Glass Co.

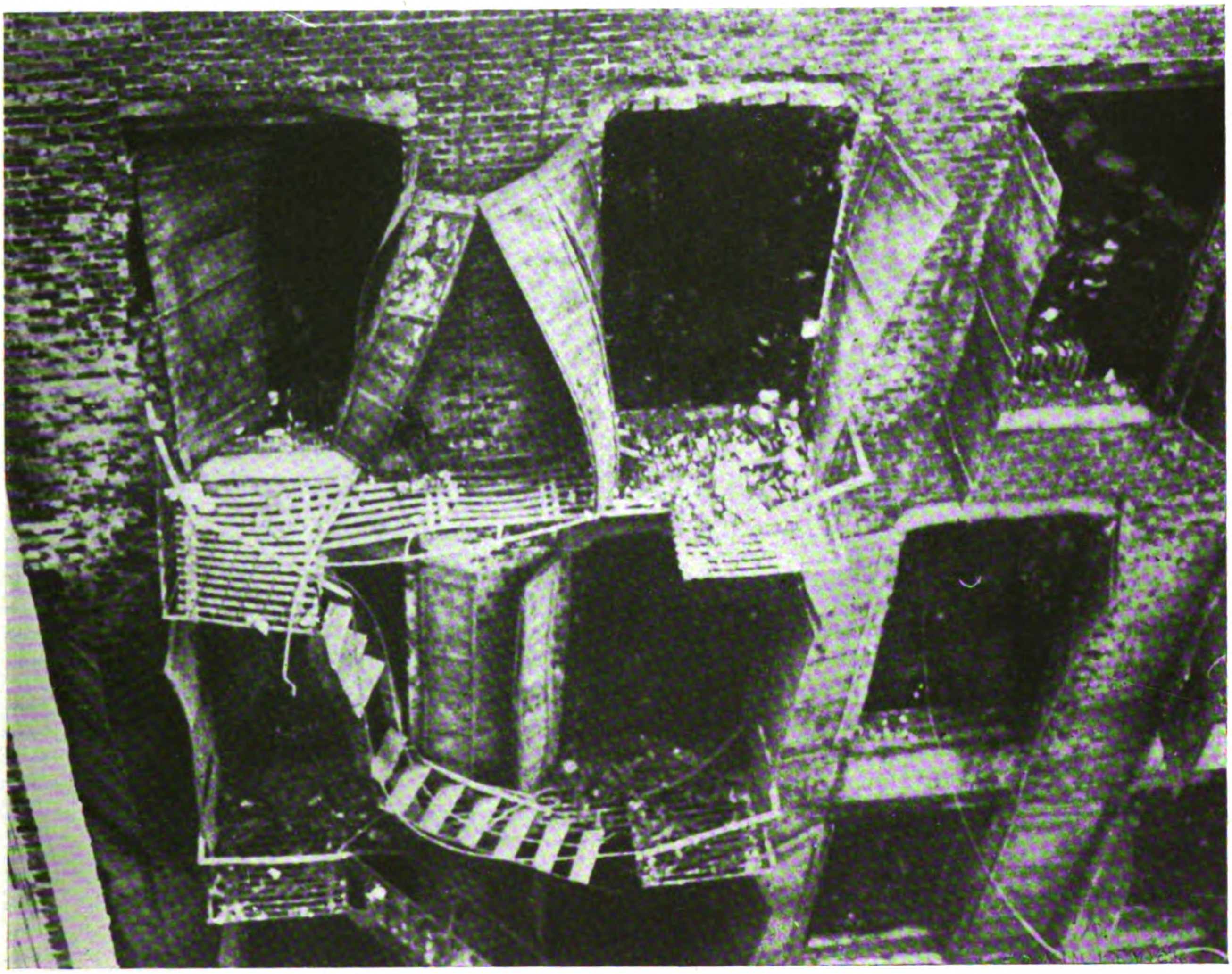
of buildings which are being erected every year with scarcely a thought on this subject. Every day fires are occurring which prove the fallacy of building without proper protection against exterior exposures and also proving the utter uselessness of temporizing by the use of cheap and inferior forms of protection, such as metal-covered wood doors, shutters, window frames and sash; by the use of plate and common glass, where common sense advises the use of wire glass; and of sub-standard, poorly designed types of exterior opening and roof protection.

Government Recognition

The United States Geological Survey clearly recognizes this condition and the need for its remedy, as will be shown by the following interesting excerpt from "The San Francisco Earthquake and Fire," published by this department about ten years ago:

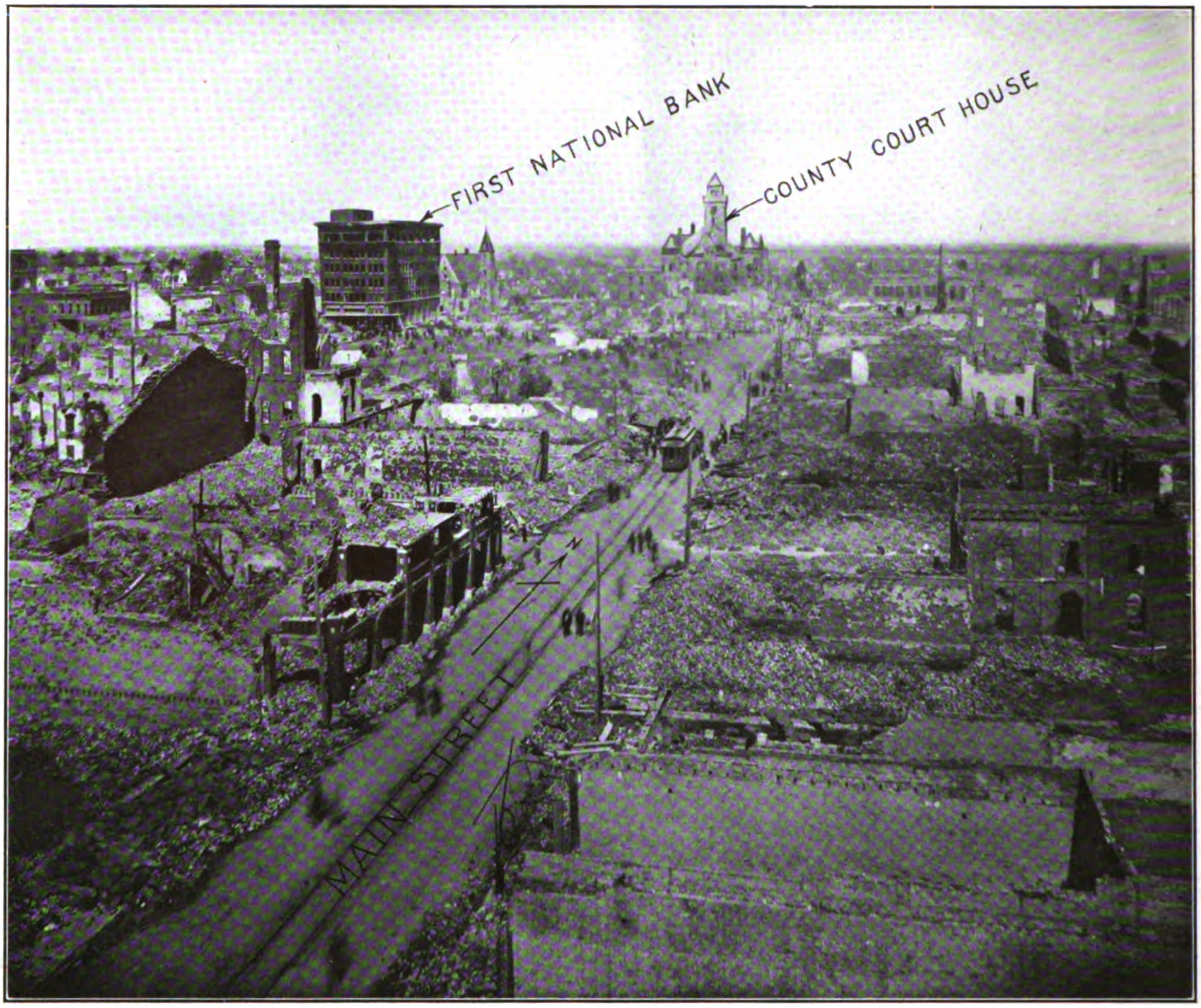
> While the fire danger from exterior fires to a given building is ordinarily estimated at 60 per cent, this risk practically becomes 100 per cent, of course, in a great conflagration. In San Francisco little protection from exterior fires had been adopted. There were few metal shutters or steel-roller shutters, and most of these were of imperfect design, proving unsatisfactory when tested. The openings in walls were fatal weaknesses in all the great buildings. Wire glass windows, though few in number, behaved well, but wooden instead of metal sashes were great sources of fiery contagion. *Metal covering over wooden doors and window frames was generally inefficient.* Ordinary glass was quickly cracked by heat from the exterior; the sashes took fire and the flames rushed in through the openings, consuming all combustible material within. Had they been furnished with metallic shutters of the best design, with wire glass in metal sashes, and with cornice and other exterior sprinklers, supplied by a private water plant, they certainly might have been saved.

While during the ten years since the San Francisco conflagration the trend of building construction has been slowly turning towards consistency and safety, the fact is evidenced more by improved building codes in the larger cities than by increased interest on the part of the building public. Those who design, build and own buildings must sooner or later come to realize the need for consistent firesafe construction—must realize that safety from fire lies in the original con-



Courtesy of Saino Fire Door and Shutter Co.

In the Asch Building fire in New York City the uselessness of iron shutters for preventing the spread of flames was clearly demonstrated. Note flimsy, unprotected fire escape. Had these shutters been of the automatic, hollow steel type, and windows of wire glass in metal frames, the horrible tragedy enacted in this building would never have occurred



Courtesy of National Board of Fire Underwriters.

The conflagration of March 21, 1916, at Paris, Texas, demonstrated the vulnerability of the normal mercantile section of every American city, due to lack of proper protection against even moderate exposures

struction and equipment of every building—that *now* is the time to study such problems as that presented by exposures.

Believing that the recent Southern conflagrations have served at least one good purpose in directing the thoughts of the public toward safer construction, particularly in and near the devastated sections, and knowing that the first logical questions will be on the subject of exposures and methods of guarding against them, this article has been prepared for the purpose of giving a clear conception of what constitutes dangerous exposures; materials and methods of construction which will reduce or eliminate such danger; and to offer a practical example of the manner in which to attack this problem.

Lessons of Conflagrations

As stated in the opening paragraphs of this article, the recent Southern conflagrations offer clear evidence as to the danger of unprotected exterior openings and the value of proper protection.

In the Paris, Texas, fire, as shown clearly by the accompanying photographs, the action of the fire on individual buildings is of great interest. The Gibraltar Hotel (p. 276) was in the center of the path of the fire. This was a six-story reinforced concrete building with brick curtain walls. The window openings on the north and south sides and on the angle exposure in the court were protected by wired glass windows in metal sash; the front and rear windows and those on the south side, over the two-story portion, were plain glass in wooden sash. The photograph shows the fallacy of partial window protection, and demonstrates very clearly that those who planned this building did not realize the severity of the conflagration and exposure hazard.

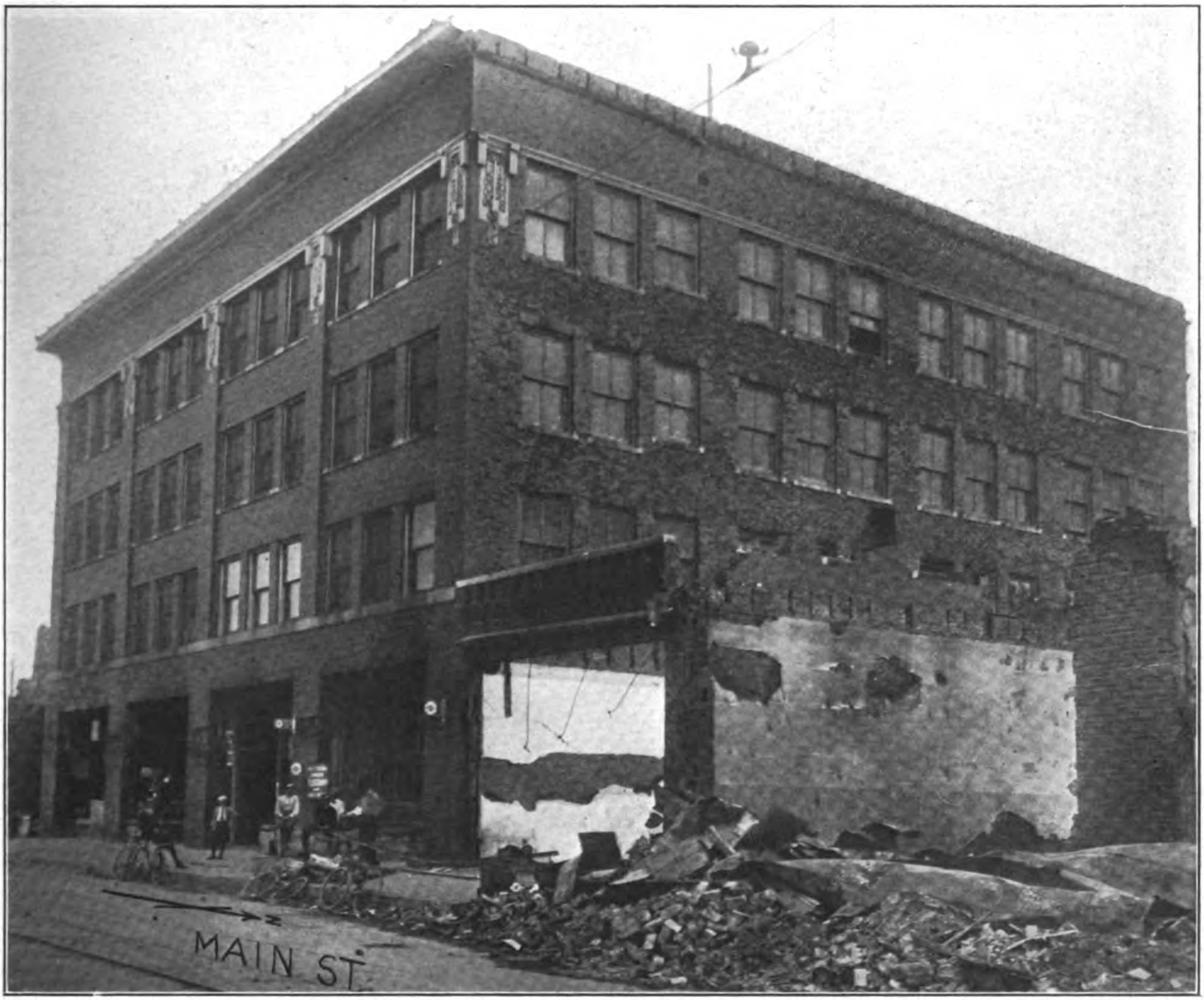
Contrast this with the behavior of the Bellford Apartments, four-story reinforced-concrete building with brick curtain walls (p. 271) and opposite the Gibraltar Hotel. Windows on south, north and rear were protected by wire glass in metal sash. Exposures consisted of an 18,000 square foot, one-story joisted-brick stable in the rear, small one-story joisted brick on south, and one- and two-story joisted-brick mercantiles on the north. The occupants abandoned the building as the fire approached. As the photograph shows, the properly protected exterior openings withheld the flames, although radiant heat burned small holes in rugs, bedding and wooden flooring in several of the rooms on the exposed side. The terrific heat here spalled bricks in the exterior wall.

In the Augusta, Ga., fire the local underwriters make the following statement:

"The utter inability of a fire department to control a fire in a building of large area and fair height in which a fire can spread from cellar to roof in a period of time shorter than that in which the fire department can respond and get into effective operation; the necessity for eliminating frame additions to brick buildings; protecting exterior and interior wall openings, enclosing vertical openings; and the necessity for proper construction of parapets, skylights and dormer windows; the inability of a fireproof building, even if not occupied, to act as a fire barrier when not equipped throughout with properly protected windows;; the danger of shingle roofs and the manner in which they spread fires beyond the ability of a fire department to handle, with ordinary wind blowing, even when a fair proportion of the buildings are brick and have non-combustible roofs and buildings are not congested; and the further fact that wide streets do not form a fire break when shingle roof construction is present."

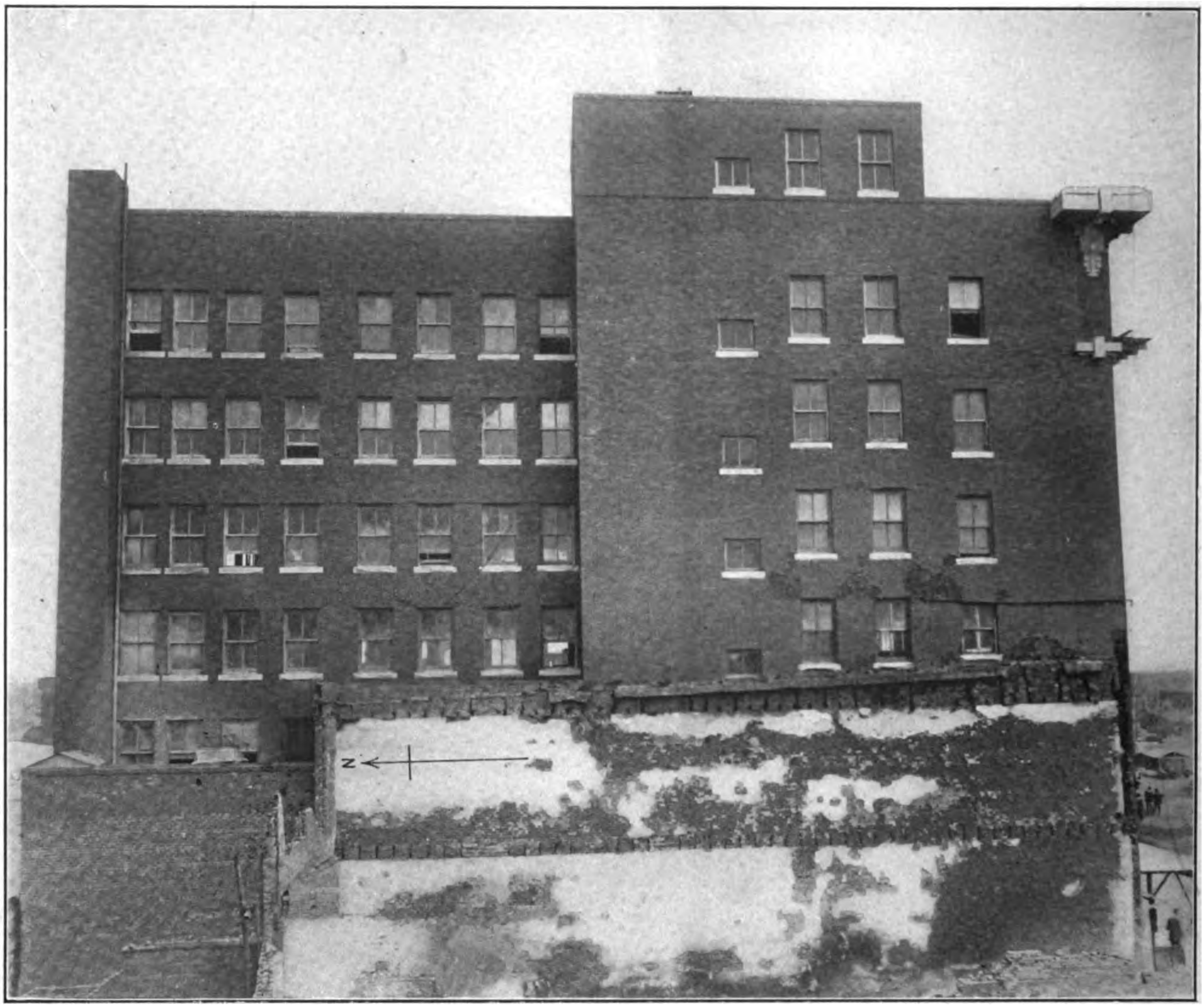
In speaking of the Baltimore conflagration, F. M. Griswold, then general inspector of the Home Insurance Company of New York, said in 1904:

"It is my most assured judgment that, notwithstanding narrow streets and inferior construction of buildings, the fire would not and could not have seriously spread had proper precaution been exercised in the protection of exposed wall openings, together with the use of non-combustible cornices and roof trim; and, in at least partial support of this assertion, it is a fact that where wire glass in metal frames



Courtesy of National Board of Fire Underwriters.

The Bellford Apartments in the Paris fire. Excellent protection provided by wire glass in metal frames



Courtesy of National Board of Fire Underwriters.

FIRST NATIONAL BANK, PARIS, TEXAS

Wire glass in metal sash withstood a temperature of about 1,500 deg. F., with fire on both sides—spalled brick work and limestone window-sills. Street fronts not protected—building gutted by exposure across 60-foot street

(though not the best) was exposed to the heat of the conflagration, both front and rear, no damage by fire to the interior resulted, while in the case of imperfect metal-clad shutters, such as appear to have passed as approved, but little restraint to the spread of flame is evidenced, and this is also true of wire glass, where it was encased in metal-clad wooden frames and sash."

Guarding Against Communicated Fire in Dwelling Houses

The term *exposure* may best be defined as a possible source of communicated fire. Exposures are both interior and exterior.

An interior exposure is a subdivision of space within the walls of a building which will not confine a fire which may originate therein but will allow such fire to spread throughout the building.

An exterior exposure is that which presents the potential hazard of communicated fire.

For the purpose of this article, exterior exposures alone will be considered and the general conditions and types of structures which constitute serious exposures will be considered in detail in later paragraphs.

The matter of the exposure hazard is of the greatest importance in the planning of every type of building. It is, however, usually applied only to buildings of the larger type, and only a brief consideration of the exposure problem in dwelling house construction will be given.

In the construction of the average dwelling house the question of eliminating the hazard of communicated flames resolves itself immediately into the elimination of the criminal wood shingle roof and the dangerous frame exterior.

Better than any pen the black tracery of conflagration, after conflagration, has written the condemnation of this type of construction. A wood shingle roof, even in sparsely built sections is dangerous, the chimney offering a severe exposure hazard. There exists no longer conditions that render a masonry exterior impossible from the financial standpoint. From the aesthetic point of view, fire-resistive shingles are equal to wood. All these conditions have been and are continually explained in the various issues of CONSTRVCTION and do not need repetition or elaboration here—in short, *"Use fire-retardant roofing and exteriors for dwellings."*

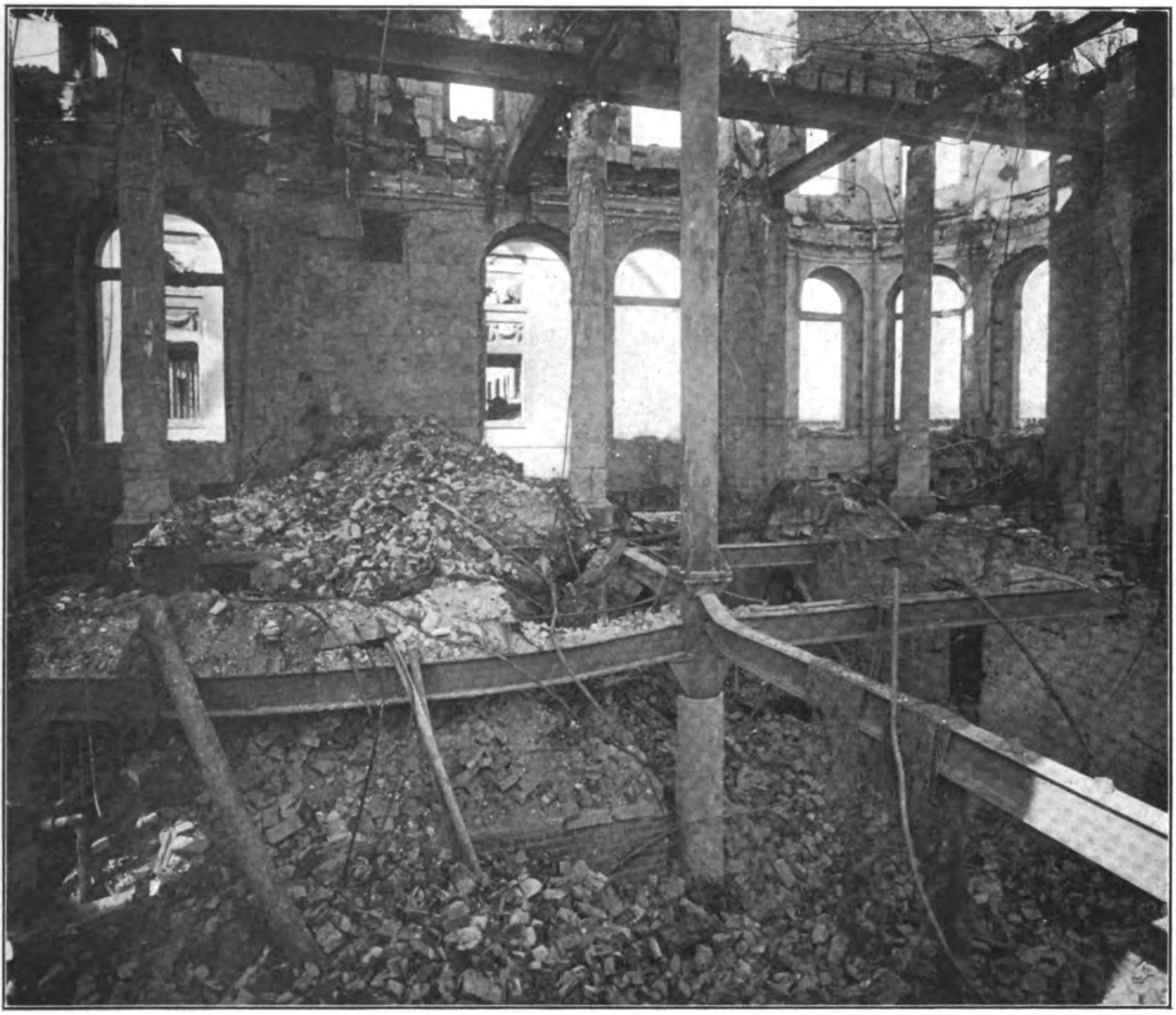
Protecting Large Buildings Against Exposures

Roofing—

The roofing question has been discussed in detail in previous issues and will here be considered only in a general way. In the construction of dwelling houses and all other small buildings the roofing should be of fire-retardant type in order to guard against the flying-brand hazard. In the construction of larger buildings the selection of a roofing is deserving of very careful consideration. There are at present many good types of roofing and methods of application, each of which has particular points of excellence. In general, the roof on large buildings should be fire-retardant and possess enough weight and strength to have a blanketing influence in flames within the building. Roofs of poor and light-gauge tin, as well as light, cheaply manufactured "ready roofings," should be avoided. When a tin roof is desired it must be remembered that there are only three or four good brands of tin roofing to be had in this country. Ready roofings, which are numerous, should have the approval of the underwriters' laboratories.

Exposures—

The question of protection against exposures naturally divides itself into two sections for consideration: First, providing proper protection in new buildings; and, second, the alteration of existing buildings to provide safeguards against the entrance



Courtesy of National Board of Fire Underwriters.

INTERIOR OF OLD POST OFFICE, PARIS, TEX.

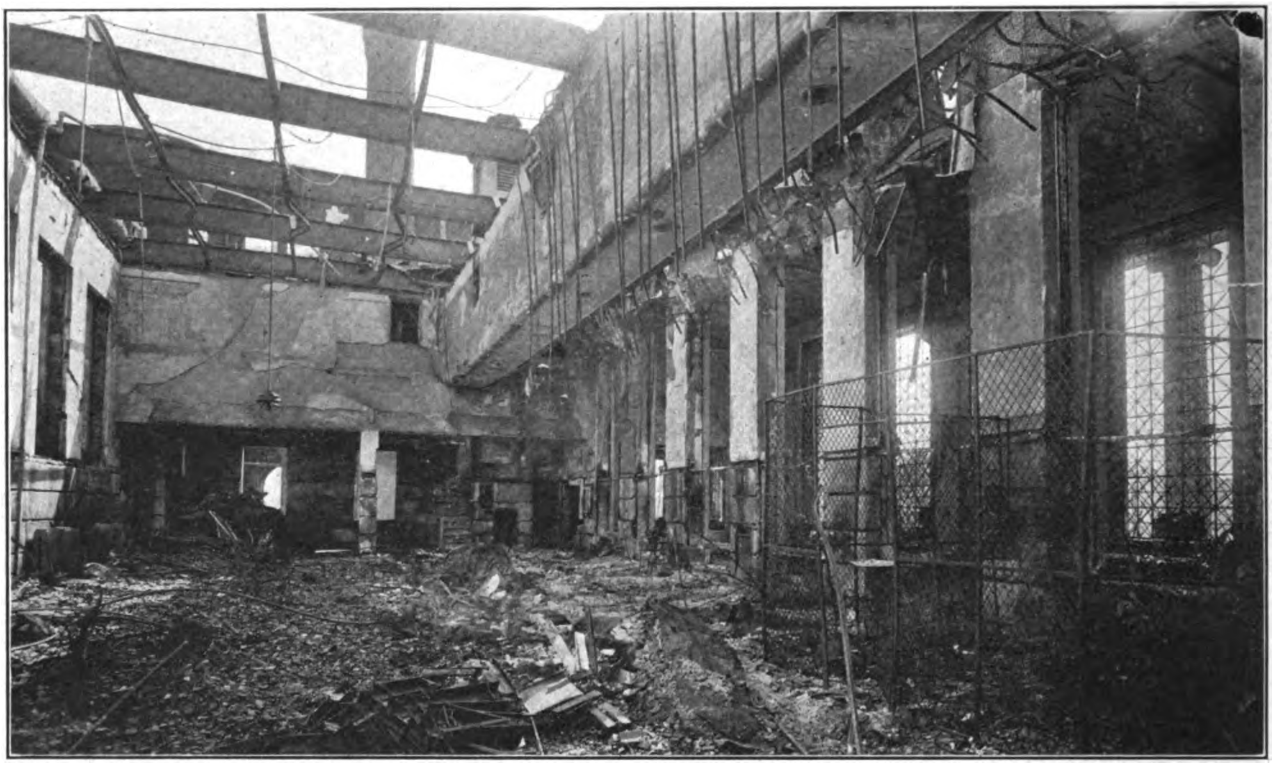
Unprotected against exposures both exterior and interior of flame from nearby fires.

In the matter of the construction of new buildings, while no general definite rule for exposure protection can be laid down, good practice may be defined and the methods of arriving at what constitutes proper protection for the individual building in hand may be outlined.

Exposure protection necessarily resolves itself into an individual consideration. Ordinarily no two buildings are of necessity protected in exactly the same manner, as no two buildings bear the same relative location to the exposures involved. Obviously then, the first step is a careful consideration of the location of the building in question and its present *and probable future* surroundings. What are the exposure hazards, or what are they likely to be? Is there danger of fire spreading from nearby buildings? Is there a possibility of new buildings being constructed nearby which will present the menace of spreading flames?

It is plain that the exposure is not so great in a residential neighborhood or in a district where the surrounding buildings are of fireproof construction or contain little inflammable material as it would be if it were where the building site was surrounded by non-firesafe structures or are used to house businesses which necessitate the handling and storage of highly inflammable matter.

In the planning of large buildings to be located in or near residential districts, one important factor must not be overlooked. That is wood shingle roofs and frame construction of dwelling houses. In another section of this article we have considered the matter of guarding the dwelling house against exposure hazards. Here we must consider the conflagration danger. The records of almost all great conflagrations show flames traveling by the wood shingle and frame construction route straight into the heart of the mercantile or business section. Where it is planned to construct a large building in a section which is thickly built up with frame and wood shingled dwellings the exterior of the building must be made absolutely fire-resistive.



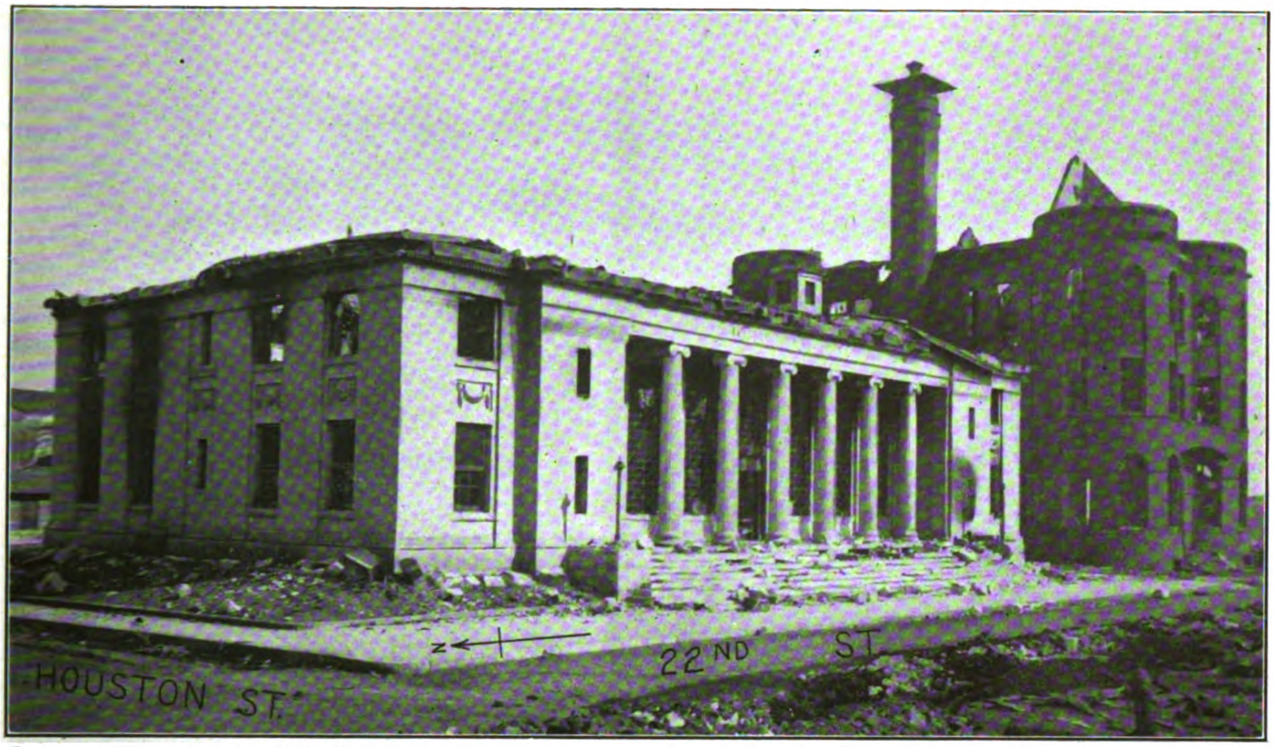
Courtesy of National Board of Fire Underwriters.

INTERIOR OF U. S. POST OFFICE BUILDING, PARIS, TEX.

Showing unprotected roof structural members

At first glance a large group of frame dwellings does not appear to offer any serious fire menace to a large building. It would seem impossible for sufficient heat to be generated to do serious damage; but fire records tell a different story. High winds and dry wood on the roofs and in the walls of dwellings menace thousands of mercantile buildings in this country to-day, and such exposure must be guarded against.

The recent conflagration at Paris, Texas, started in a one-story-frame-shingle-roof-storage warehouse, presumably from a locomotive spark on the roof. Flying brands, borne by the high winds, set fire to shingle roofs four blocks north and, feeding on



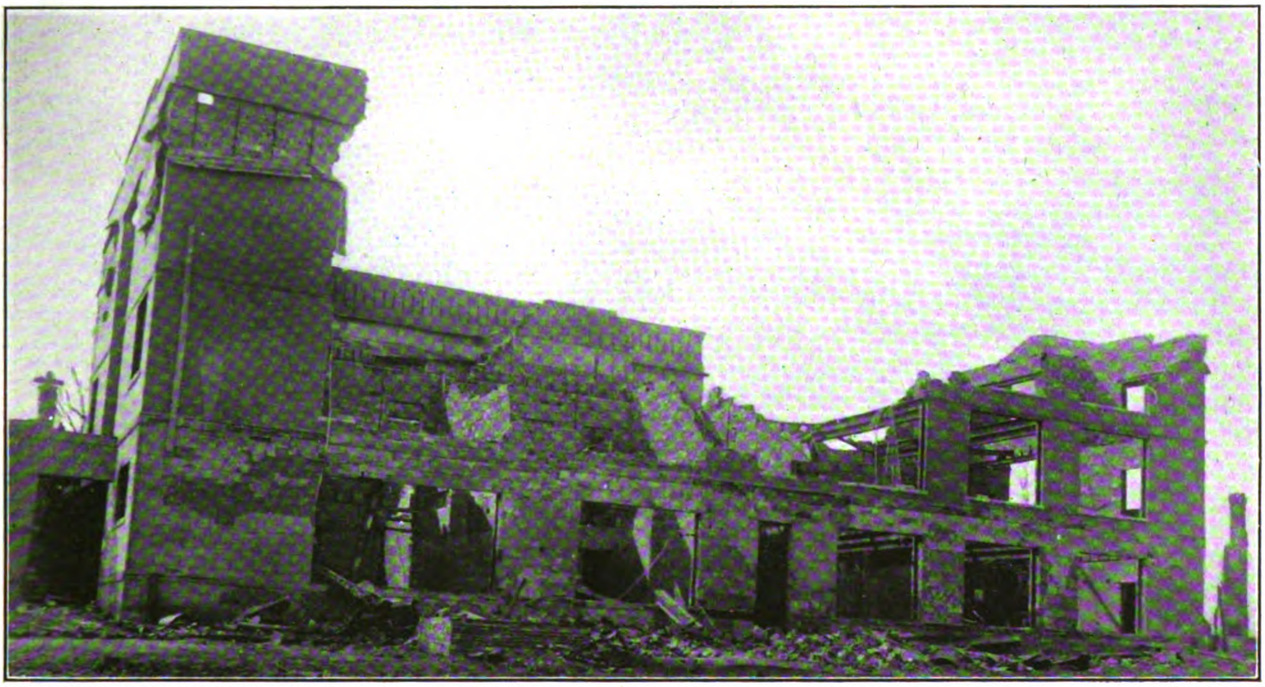
Courtesy of National Board of Fire Underwriters.

U. S. POST OFFICE BUILDING EXPOSED BY OLD POST OFFICE BUILDING ON SOUTH—PARIS, TEX.

Unprotected windows and skylights—roof structure of unprotected steel

shingle-roof-frame houses, soon rolled with terrific heat and clouds of flying brands and burning shingles into the principal mercantile district, which was practically entirely destroyed. From here the flames communicated by the same shingle-roof route to the dwellings in the northern section.

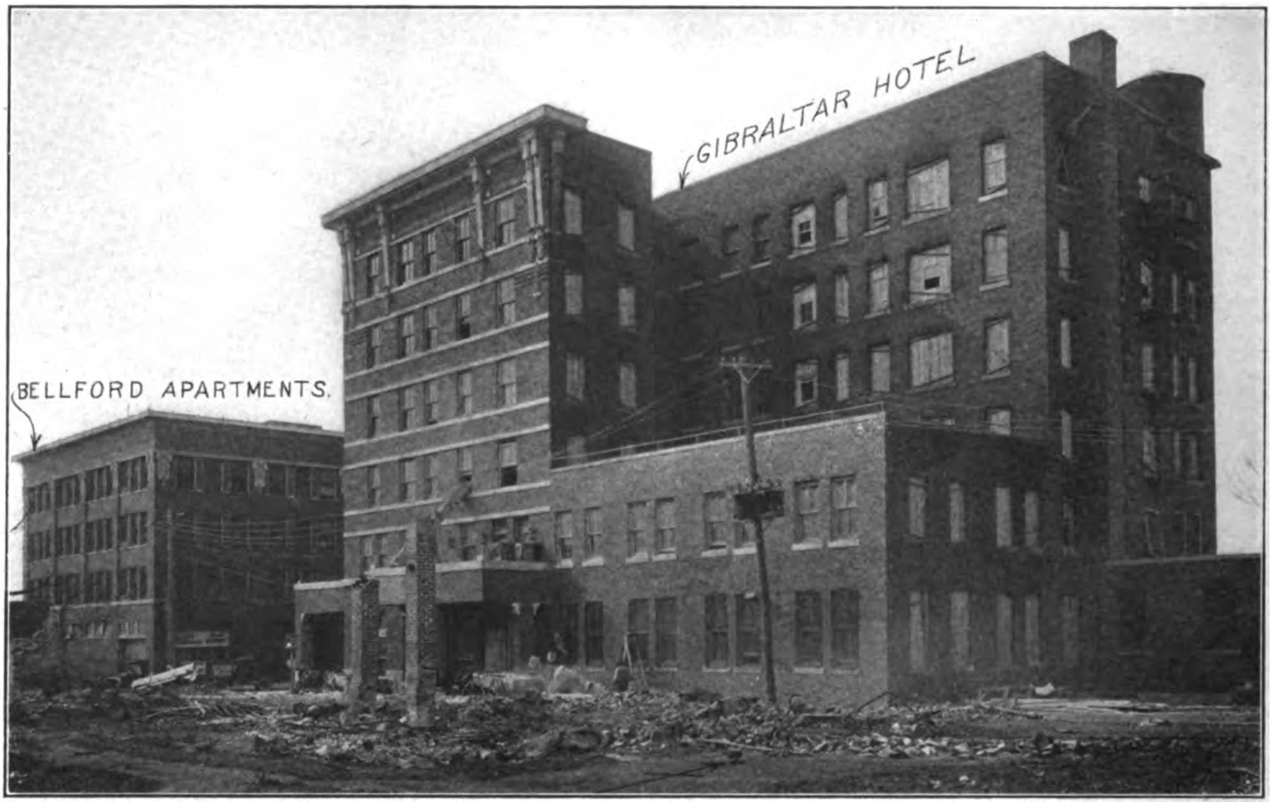
At Salem, Mass., the great conflagration started in the mercantile district, traveled out through the residential district along shingle roofs and frame houses, circled down towards the water front and set fire to the Naumkeag Mills, causing a $3,000,000 loss there. This was in the second conflagration, immediately fol-



Courtesy of National Board of Fire Underwriters

HIGH SCHOOL ANNEX, PARIS, TEX.

The inconsistent construction of the average school building is evidenced in every conflagration



Courtesy of National Board of Fire Underwriters.

BELLFORD APARTMENTS AND GIBRALTAR HOTEL, PARIS, TEX.

Note unprotected windows (boarded up after fire) in latter building. The failure of partial protection is here shown. This building was gutted, while the Bellford Apartments, fully protected by wire glass in metal frame, was saved

lowing the first, which had practically died down when a shingle roof on a school, across the valley in South Salem, caught fire from flying brands and created another conflagration, which resulted in the destruction mentioned.

The Severity of Exposures—

There are many factors which must be taken into account in the consideration of the severity of an exposure, and it is naturally difficult to give any definite requirements determining the degree of exposure. In general, however, serious exposures are as follows:

(*a*) A building of combustible type, 25,000 cubic feet or more in size, and located within forty feet of the structure in question.

(*b*) A smaller building within the same distance and containing highly inflammable material; such as a moving-picture theatre or building in which nitrocellulose films are stored; garage; or any building, such as used for the storage of oils, paints, varnishes or any material which would serve to create a quick, hot fire.

(*c*) If the adjacent buildings are of combustible type and have large areas such as a theatre or contain a large amount of inflammable material, such as a furniture or piano factory, they constitutes dangerous exposure to a distance of seventy feet.

(*d*) If there are a number of combustible buildings within an area of 250 feet from the building, so that a fire might become general in this area, the conflagration hazard exists and a serious exposure hazard is constituted.

(*e*) If the proposed building is located in a conflagration district it should be considered as seriously exposed.

The amount of protection which will be provided will, therefore, depend on surrounding buildings, their

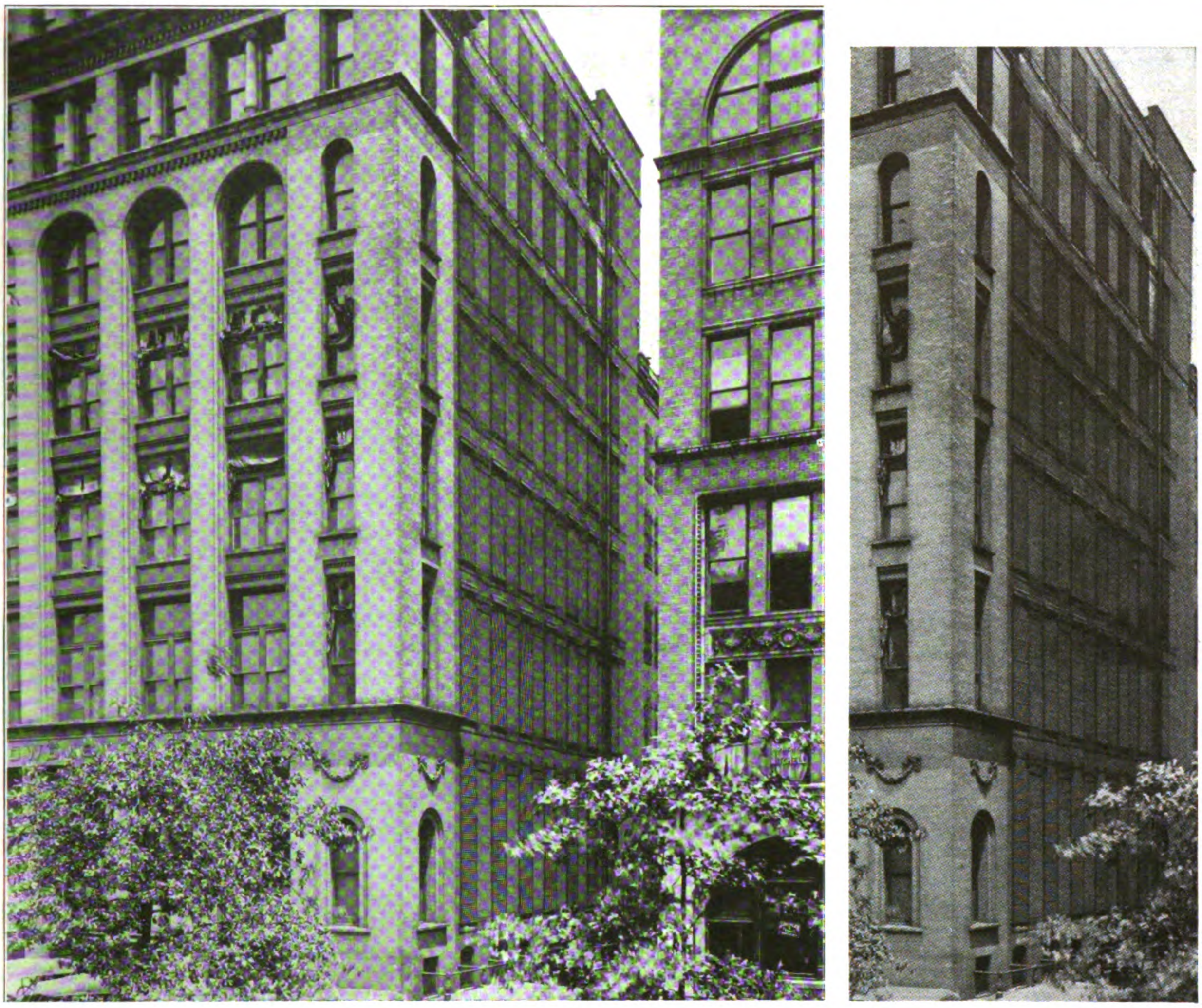
FIRST NATIONAL BANK, PARIS, TEX.

Plate glass in wooden sash on both street fronts fell out and fire swept through the building

construction, contents and distance from the building in question.

In general, the following rules should be followed, modified somewhat, of course, by existing conditions:

The exterior walls of fireproof or sprinkled mill constructed buildings should be of at least twelve inches of masonry. In case party walls are used these walls should be not less than sixteen inches in thickness. All walls should have a parapet not less than three feet high. All doors in party walls should be of a type of fire-door approved by the Underwriters' Laboratories, and having no wood in its construction, one on each side of the wall. All outside doors should be of metal.



Courtesy of Saino Fire Dood and Shutter Co.

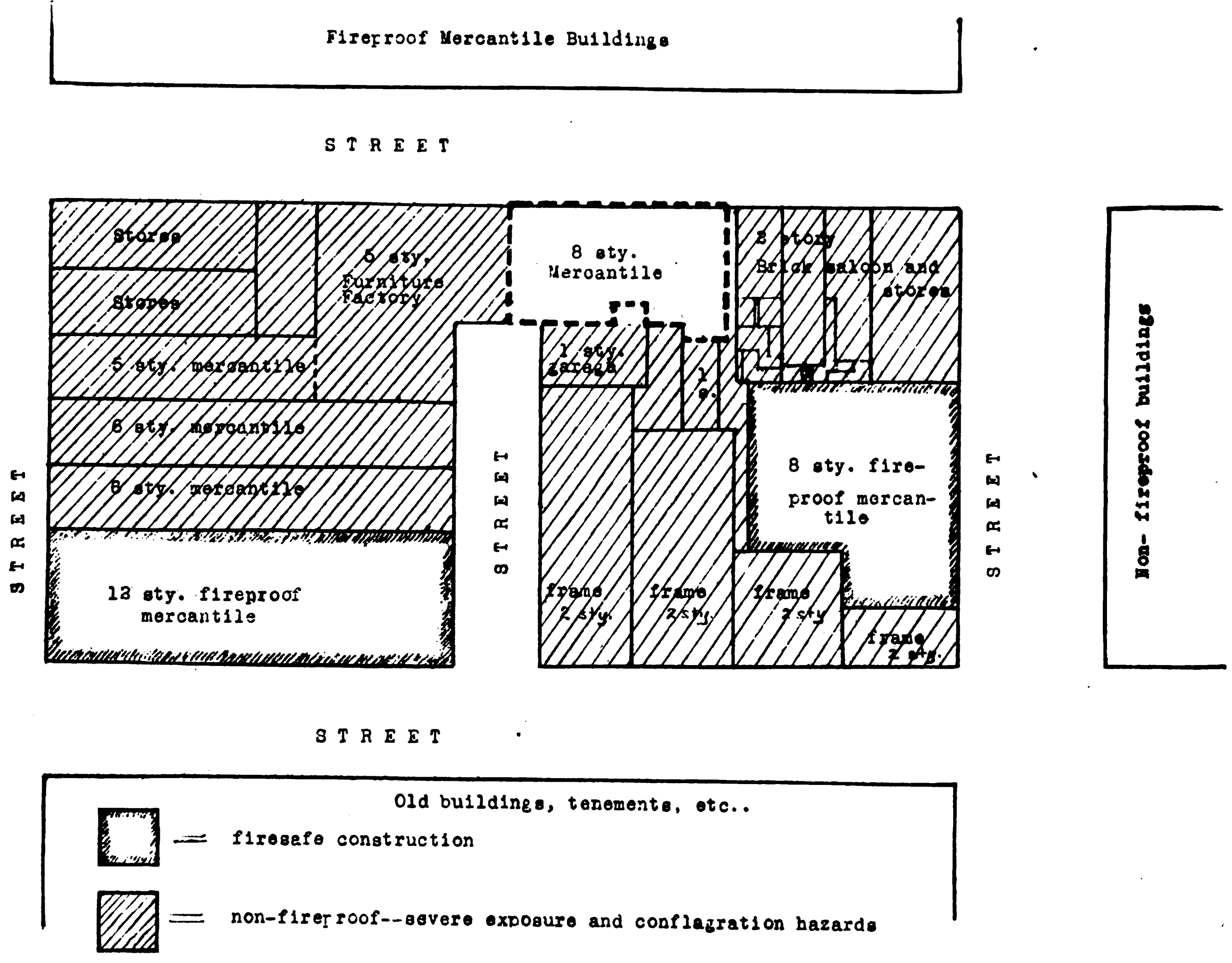
Proper guarding against serious exposure. Note shutters which operate in gangs. These shutters are of the asbestos-filled steel type and are the only swinging shutters approved by the Underwriters' Laboratories. Thousands of these shutters are in use throughout the South

Wire glass windows in metal frames and sash offer excellent protection against moderate exposures and prevent the passage of flame from floor to floor through the windows. All windows above the third floor should be of this type, and in the matter of three-story buildings and the lower three floors of higher buildings great care must be taken before the use of wire glass is decided against. The exposures must be studied carefully, keeping in mind the size of the building, the advantages of wire glass from the breakage as well as the fireproofing standpoint, the expense of changing to wire glass at a later date should exposure conditions be made more severe, the fire-fighting facilities of the community and the insurance saving where wire glass is used.

In the selection of metal frames for wire glass windows, the weatherproof qualities must not be lost sight of. Some types of metal sash and frames corrode quickly and should be avoided, the architect insisting on assurance as to this point from the manufacturer. Here enters, too, the question of kalamein frames and sash, which should be avoided and will be considered in another section of this article.

Where windows are seriously exposed they should be protected by properly constructed shutters in addition to wired glass. (The best types of fire resistive shutters are described in the last section of this article.)

In determining the type of shutter to be used, the following points should be taken into consideration: Tin clad and sheet iron shutters are not considered reliable. The wood core shutters are subject to the rapid weakening and deterioration of dry rot, and the flat metal shutters transmit more heat than those of the types which will be hereinafter described.



In the above sketch the 8-story mercantile outlined with heavy dotted lines is the building to be protected against exposures and on which insurance exposure table on Page 283 is based. Description of protection will be found in this article

How Safe Exteriors are Created

Having considered in a general way the conditions which create exposures of a more or less serious nature, the natural question is how to guard against these exposures in the most practical and efficient manner, considering always the factor of cost—and right here a digression will be made to emphasize this matter of cost.

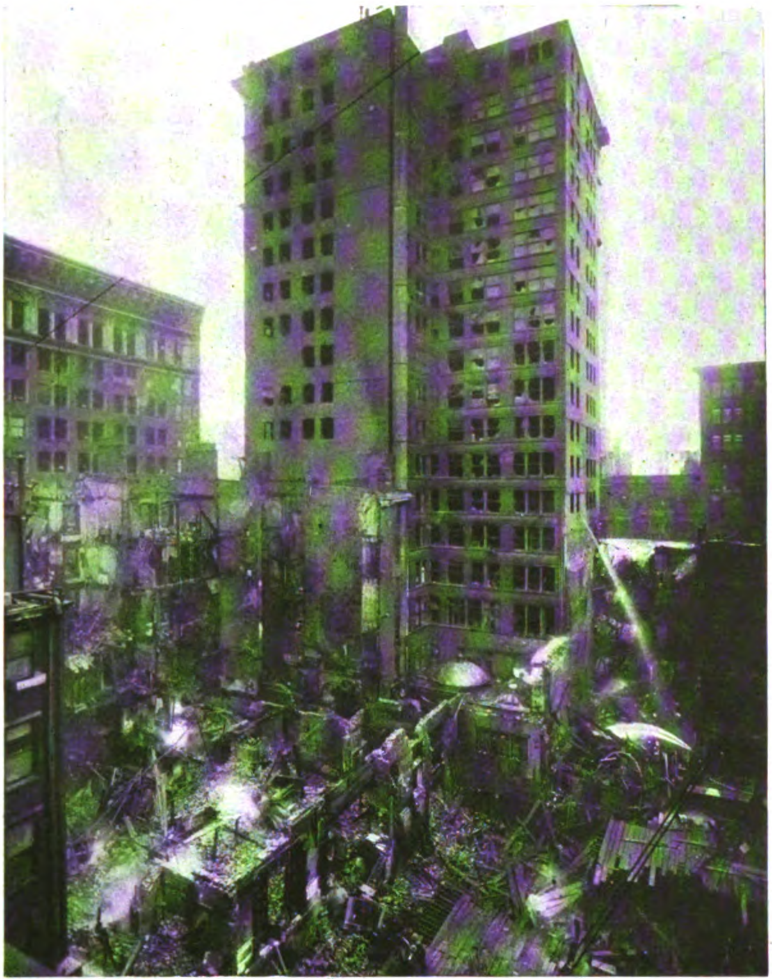
The Cost Factor—

From the standpoint of those who purchase structural materials, cost can no longer be defined as the amount of money paid for a material or device. We build our buildings for permanency, our office buildings, hotels, warehouse and mercantile structures are erected with the idea that they will stand for many years and give good service; therefore the *real* cost is the ultimate cost and can better be defined as the total expense of the installation and maintenance of materials and devices plus or minus the insurance credit or penalty granted or imposed for the use of the product in question. In other words, in the consideration of the protection against exposures various questions of cost versus ultimate cost must be decided. For instance, window frames and sash of solid or hollow steel have a far higher degree of permanency and necessitate a much lower cost of maintenance than those of metal-covered wood, at the same time offering far greater safety. It is false economy to let the lower first cost of metal-covered wood windows influence the builder to install this type, or wooden windows or metal windows of inferior design and workmanship—it is false economy to use plain glass where wire glass should be used, even though the risk seems slight, or tin-clad doors, when all metal doors may be obtained at a slight increase in price. Buy with the sure knowledge that safety and permanency are the cheapest in the end.

A Practical Example—

With this eminently sensible view of the cost proposition in mind, let us consider a practical example of protection. The sketch on page 278 will serve as a basis on which to work. This shows an ordinary city block in a mercantile section. We are considering the construction of an eight-story mercantile building in the location designated by the heavy dotted line.

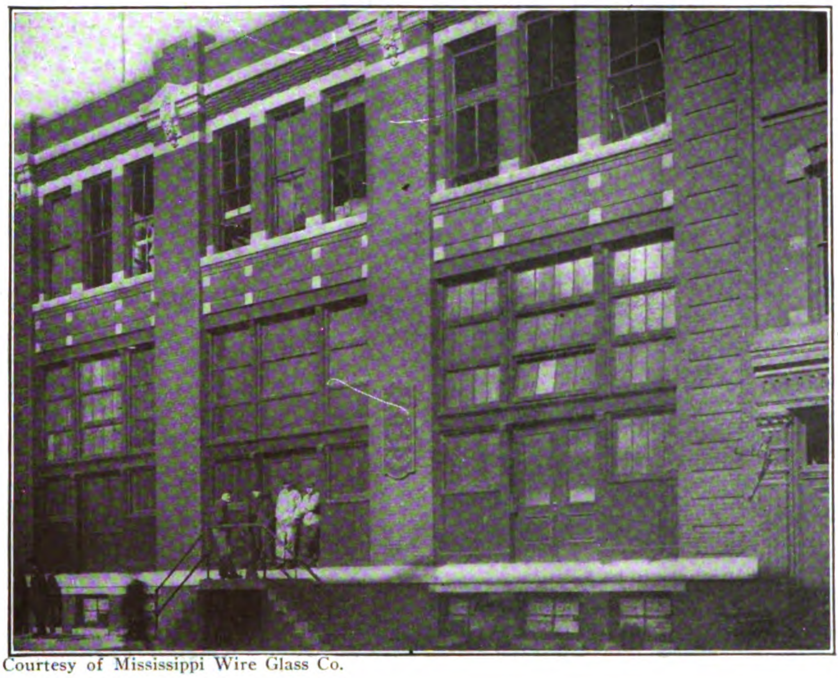
A study of the map shows that this building is exposed on both sides and the rear to a severe conflagration hazard, which in itself necessitates the utmost care in safe design. The five-story furniture factory immediately adjoining constitutes a severe exposure, containing as it does a hazardous occupancy where much inflammable material in the form of wood, paints and oils is used and stored, and being of joisted brick construction. A fire in this building would most seriously threaten the structure under consideration, and for this reason the best known protection for window openings should be employed. This consists of wire glass in metal frames and each opening further protected by the use of automatic steel shutters from the terrific heat which would be generated by a fire in this building. If there are door openings on this side, they should be protected by automatic metal (not metal-covered wood) fire doors. All protection should be of types approved by the Underwriters' Laboratories. In this manner the side of the building in question, which we will call the west side, has every opening in the masonry wall protected in such a manner that in case of fire in the furniture factory the heat would cause the automatic doors and shutters to



Courtesy of Mississippi Wire Glass Co.

UNION TRUST COMPANY BUILDING FIRE, DECEMBER 11, 1912

Owing to lack of proper protection against exposures the building shown was completely gutted



Courtesy of Mississippi Wire Glass Co.

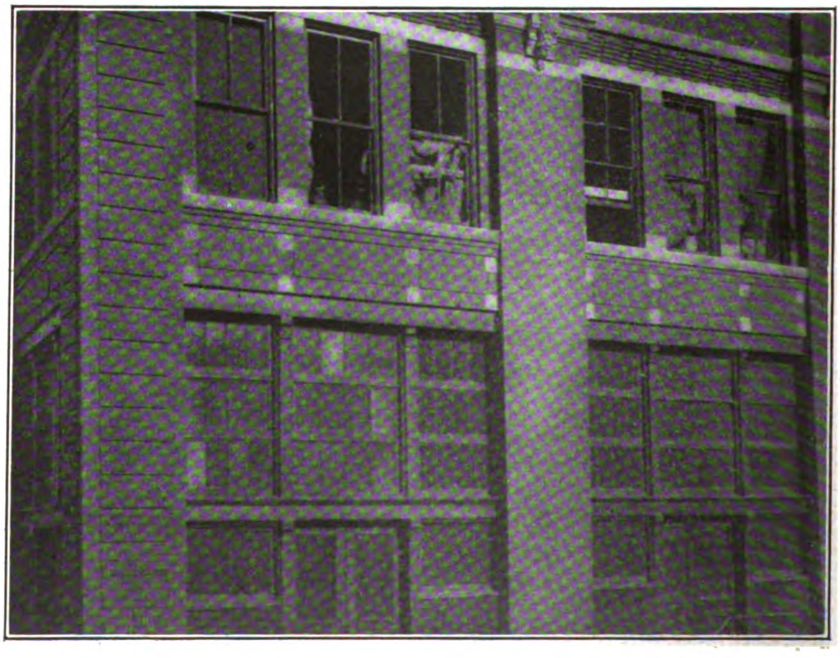
"Wire Glass" in lower floor protected the machinery, etc., so that business was not interfered with—

close when the fusible links with which each is equipped had been melted. Here we would have a standard fire door barring the progress of the flames, heat and smoke through the door openings; and metal shutters, backed by wire glass and metal windows, protecting the window openings—a solid, impenetrable wall against which the flames will seek entrance into our building in vain.

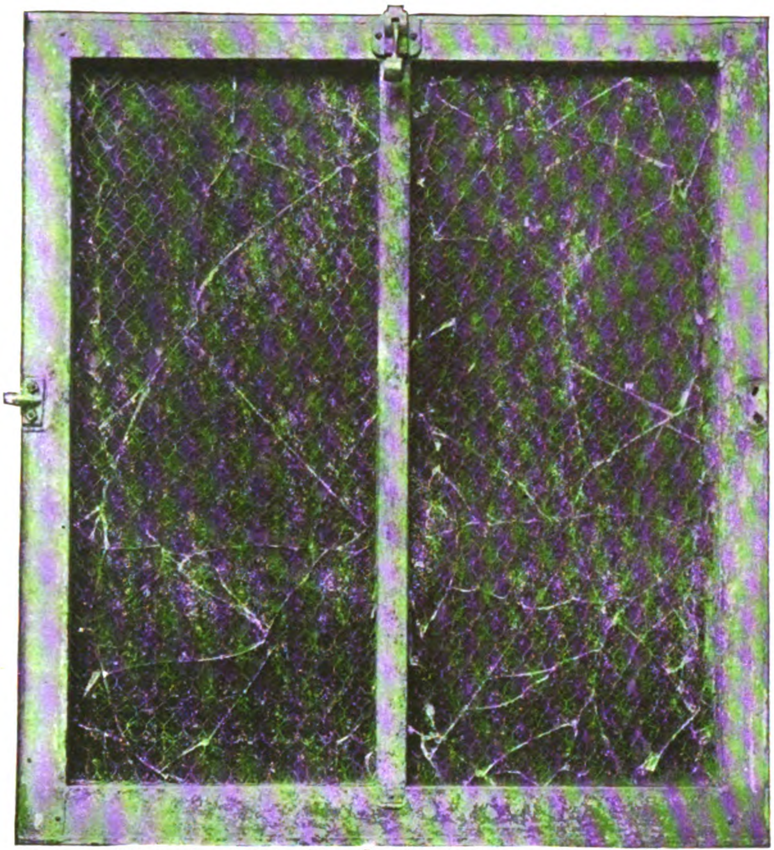
On the opposite or east side of the building, we have different conditions entirely, the building adjoining being only two stories in height. The exposure here is severe at the lower stories. All windows should be of wire glass in metal frames and all windows over the roof of adjoining buildings to a height of 30 feet should be equipped with steel shutters.

On the rear or south side of the building all windows west of the court, being over the garage and also exposed to possible fire in the furniture factory, should

—while the plain glass in the upper floor was completely blown out by the force of the explosion.



A window sash containing solid wire glass removed from the Western Electric Company's California Electrical Works after the earthquake and fire of April 18, 1906

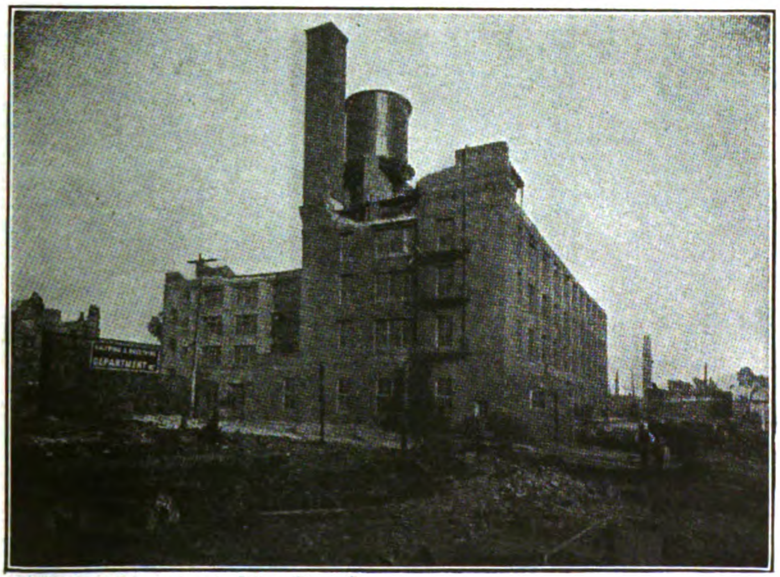


Courtesy of Pennsylvania Wire Glass Co.

be of wire glass in metal frames and equipped with automatic shutters. Windows in the shaft should be of wire glass in metal frames, while those east of the court would be of wired glass, shutters being necessary only opposite and one story above the one-story building shown adjoining.

The use of shutters as a further protection where the exposure is unusually severe is a precaution in case of the possible generation of heat that would cause the melting of wire glass. On these windows shutters alone would not be sufficient protection because of radiant heat.

The walls in this building will of course be of at least 12 inches of masonry, and if steel framework is

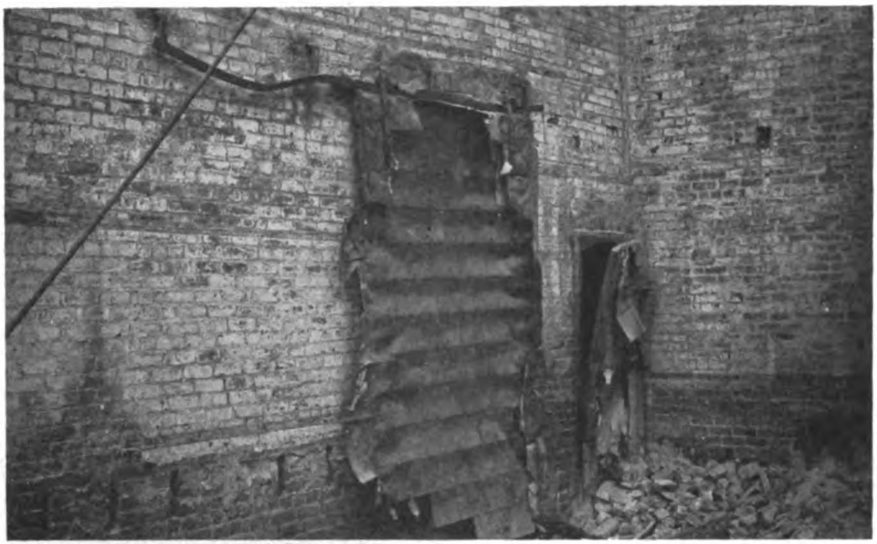


Courtesy of Pennsylvania Wire Glass Co.

SAN FRANCISCO CONFLAGRATION, APRIL, 1906

NOTABLE EXAMPLE OF WIRE GLASS PROTECTION

The Western Electric Company's California Electrical Works was saved, although everything else in the vicinity was destroyed. This was a four-story brick building with "Solid Wire Glass made by the Continuous Process" in windows. The area of the glass windows was large and the test a very severe one, particularly on one side. The building was equipped with sprinklers, but the heat inside was not sufficient to operate them. The most severe local exposure was a four-story frame lodging house 35 feet distant, and a large pile of some 40,000 wood cross-arms, all of which were totally destroyed. Employees fought the fire from the inside with water pails, extinguishing incipient fires which were started by the intense heat.



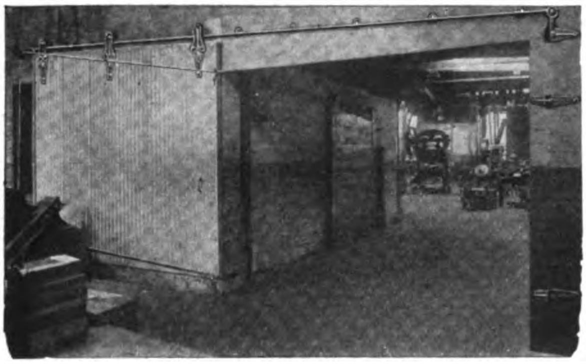
Courtesy of Saino Fire Door & Shutter Co.

The tin-clad, wood-core fire door is subject to deterioration by rust and dry rot, and within a very few years after installation constitutes a most inefficient protection against exposures

used care will be taken to protect the ends of beams and girders so that they will not be affected by the heat of a nearby fire.

Importance of Protecting All Openings—

The importance of protecting *all* exterior openings cannot be too strongly emphasized. The San Francisco conflagration offers a case in point. The eight-story building of the Pacific States Telephone & Telegraph Company, then recently completed, had excellent window protection, the front being provided with Kinnear rolling steel shutters, with plate-glass windows, while wire glass was used on the sides and back of the building. Unfortunately, however, a rear door had not been protected, and the fire entered the building through this door, causing great damage and generating heat which melted glass and even welded nails.



Merchant & Evans Co.

Standard types of metal fire doors—

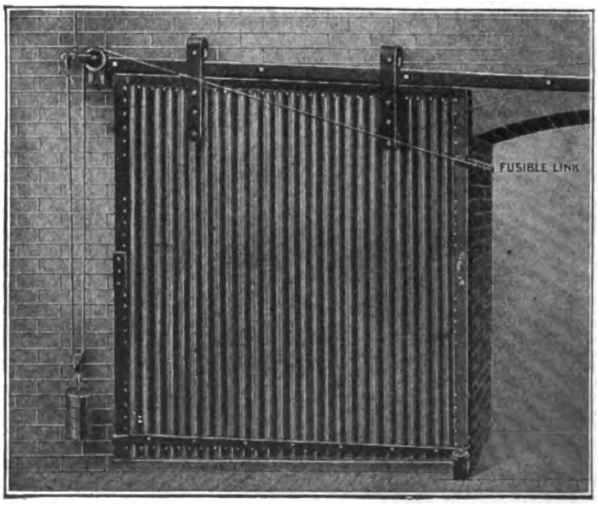
Reducing Insurance Costs

Definite proof of the value of proper protection against exposures will be found in the comparative exposure table shown on page 283. A clear exposition of the actual working out of insurance rates will be of direct interest to those who plan commercial structures.

The table shown on page 283 shows the method of working out the exposure charges on building and contents of building heretofore discussed.

The final insurance rate on a building and its contents is made up of the rate on building and contents, plus the exposure charge. As we are only interested in the exposure charge for the purposes of this article, we will take for granted that the building rate (without exposure charge) is .25. Thus in the table the rate is shown as .25.

In the table given it will be plainly seen that the exposure rates have been figured three times, each



Saino Fire Door & Shutter Co.

—which are far superior to the tin-clad door. No wood in the construction of these doors

Comparative Exposure Table

Calculate the initial charge, as per tables, for given distance or condition for each side and enter in its column, add or subtract from charge as follows, carrying the net result by successive processes down the column to the bottom.

EXPOSURES

RISK	Openings protected by wire glass in metal frames and standard fire shutters and doors				Protected by wire glass in metal frames ,or by standard shutters				Wooden sash and plain or plate glass			
	Front	Right	Rear	Left	Front	Right	Rear	Left	Front	Right	Rear	Left
Height... 8		5	2	2								
Rate... .225		1.60	.75	.40								
Distance	No exposure	adj.	35'	5'								
Adjoining:												
Party Wall												
Independent Wall												
Windows Over		yes										
Communicating												
Length of Side:												
A-Risk		60'	✓	65'								
B-Exposure		60'	40'	✓								
Tables Used		7-14	1	1								
BLANK WALL OF RISK towards exposure deduct ⅔ of charge. (*No deduction if wooden cornice or mansard.*)		.020 .136	.097	.076		.020 .136	.097	.076		020 .136	.097	.076
" " OF EXPOSURE towards risk, deduct ⅙.		.156				.156				.156		
" " TO BOTH deduct 90 pěr cent.												
OPENINGS NOT OPPOSITE each other deduct 30 per cent.												
" ON GRADE OR FIRST FLOOR ONLY, deduct 25 per cent.												
SHINGLE ROOF TO RISK increase charges 50 per cent. but not exceeding a sum which would make risk equal rate with exposure.												
LENGTH OF EXPOSED SIDE OF RISK.—Less than 75 running feet, 1 per cent. less for each foot. *No deduction if adjoining with communication.* - 17½% 10% -15% - 7½%		.023 .133		.008		.023 .133		.008		.023 .133		.008
" OF EXPOSURE.—Less than 75 feet, ⅛ per cent. less for each foot.		.009		.068		.009		.068		.009		.068
HEIGHT OF EXPOSURE.—If less than 5 stories deduct 15 per cent. for each story less than 5. If over 5 stories and non-fireproof add 25 per cent. for each story over 5. -45%		.124	.017			.124	.017			.124	.017	
FALLING WALL HAZARD.—Add not less than 2 per cent. of the rate of the exposing risk.			.080				.080				.080	
GLASS FRONT OR SIDE OF RISK.—Increase charge 10 per cent. if first story, 20 per cent. for second, and 10 per cent. for each additional story.			.036	.031			.036	.031			.036	.031
" OF EXPOSURE.—Increase charge 20 per cent. for each glass story above first or grade floor.			.044	.037			.044	.037			.044	.037
STANDARD FIRE SHUTTERS or approved Wire Glass Windows.												
To window openings of risk.....60%.40 per cent.		.074	.026	.022								
If both.....60 " "						.050	.018	.015				
To window openings of exposure.......33⅓ " "												
If both.....50 " "		.050	.018	.015								
To risk and exposure.....45 " "						.074	.026	.022				
If both.....67½ " "												
NOTE.—The allowance noted above for wire glass windows in addition to or without shutters, where exposure is within thirty feet of the risk; for overhead exposure, then for three stories or thirty feet above exposure, the wire glass windows must be of doubleglazed type. Beyond a distance of thirty feet, either horizontally or vertically, a single glazing is the equivalent of the standard shutter, but within that distance is entitled to only one-half the regular allowance. The increased allowance provided for under this rule where both standard shutters and approved wire glass windows are installed will not apply in those cases where the wire glass windows are single glazed, unless the exposure be more than thirty feet distant.												
NOTE.—Approved open sprinklers accepted as equal to standard fire shutters.												
LARGE AREA OF EXPOSURE exceeding 10,000 square feet and height exceeding intervening distance increase charge 20 per cent. and add a further 2 per cent. for each 1,000 in excess of 10,000.												
FRAME RISK increase charge 50 per cent. but not exceeding a sum which shall make rate of risk equal to 80 per cent. of exposure.												
IF BOTH RISK AND EXPOSURE RATES ARE BELOW 1 PER CENT.—Take such percentage of final result as the rate of risk bears to 1 per cent. *e. g.* if 65 cents, 65 per cent; if 45 cents, 45 per cent., etc.			.004	.004			.007	.006			.011	.009
Total Exposure Charge for all sides.		.050	.004	.004		.074	.007	.006		.124	.011	.009
HEIGHT OF RISK.—If under five stories high, deduct 15 per cent. of total charges for each story less than five. If over five stories high and non-fireproof add 15 per cent. for each story over five (not exceeding 75 per cent.) 8				.004 .050				.007 .074				.011 .124
Deduct for Working margin 20 per cent.				.058				.087				.144
THE EXPOSURE as computed under the table, shall be reduced as follows before being incorporated into the rate:—			20%	.012				.017				.029
(*a*) By 18 per cent. in the case of the building for a risk rated on Non-fireproof Mercantile Schedule.		Building →		.046				.070				.115
(*b*) By 30 per cent. in the case of the building, and 7½ per cent. in the case of the contents for risks rated on a non-fireproof schedule other than the Mercantile.			25%	.012				.018				.029
(*c*) By 65.6 per cent. in the case of fireproof buildings not rated on the Mercantile Schedule.		Contents -		.034				.052				.086
(*d*) By 25 per cent. in the case of contents for all fireproof risks, subject to further deductions in conformity with the following table:—(as per F. P. E. M. Schedule).												

IF POLICY covers only one or more floors not cut off -15 per cent.

If cut off the following table applies:—

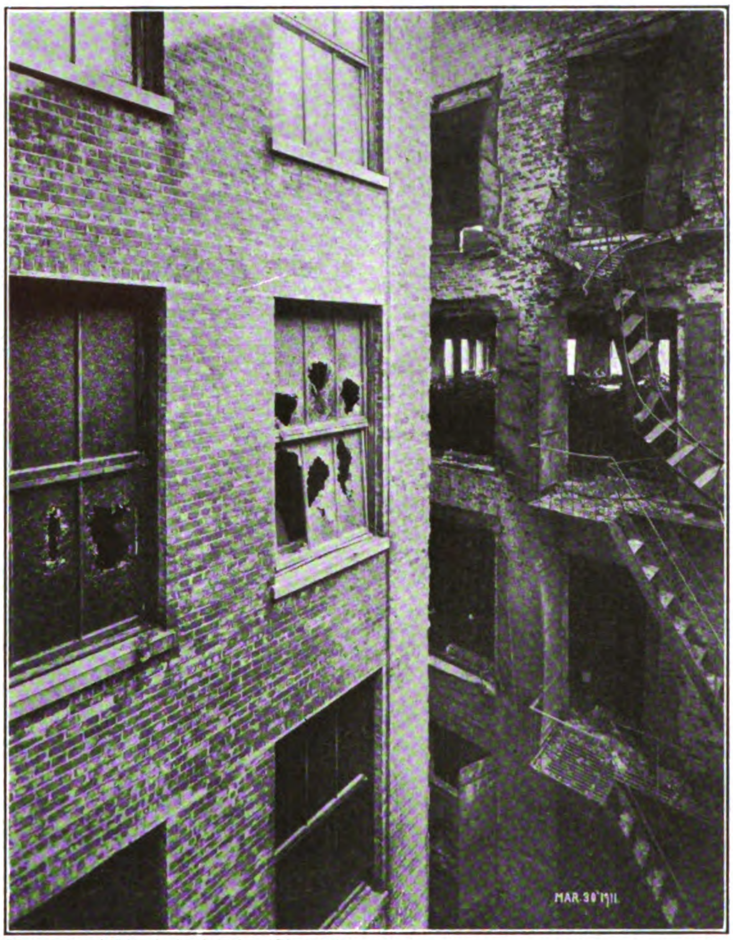
Stock Distributed over	Wood doors	Non-Standard fire doors	Standard doors
2 floors	16⅔%	18⅓%	20%
3 "	18⅓%	21⅔%	25%
4 " or more	20 %	25 %	30%

(*e*) Risks rated on the Sprinkler Schedule shall, in the exposure charge receive a further allowance in addition to that produced under the application of the table, equal to one-half the percentage grading of the equipment. This additional allowance to be made before the exposure charge is incorporated in the rate.

Note: The above tables show clearly the lowering of the exposure rate of insurance by the proper use of standard forms of exterior opening protection. Table shows:

	Building	Contents
Wire glass, metal frames and standard shutters and doors	.046	.034
Either of above with standard doors	.070	.052
Without protection	.115	.086

time under different conditions of protection against exposure. A careful study of this table will show the method by which the initial charge is arrived at, and the deductions from and additions to this charge will be easily understood if the left-hand column is carefully read. Assuming the value of this building to be $250,000 and the value of contents $500,000, and using the rates obtained in the exposure table we find:



Courtesy of Mississippi Wire Glass Co.

Note the holes punched in the "Wire Glass" windows by the firemen to enable them to fight the fire in the Asch Building from the interior of the adjacent fireproof building, the "Wire Glass" windows acting as a fire shield

Exposure charge on this building with exterior openings unprotected:

Building, $250,000, at .115	$287.50
Contents, $500,000, at .086	430.00
Total exposure charge	**$717.50**

By the use of wire glass in proper metal frames this is reduced to:

Building, $250,000, at .070	$175.00
Contents, $500,000, at .052	260.00
Total exposure charge	**$435.00**

By the use of steel shutters, in addition to wire glass, as extra protection against unusually severe exposures:

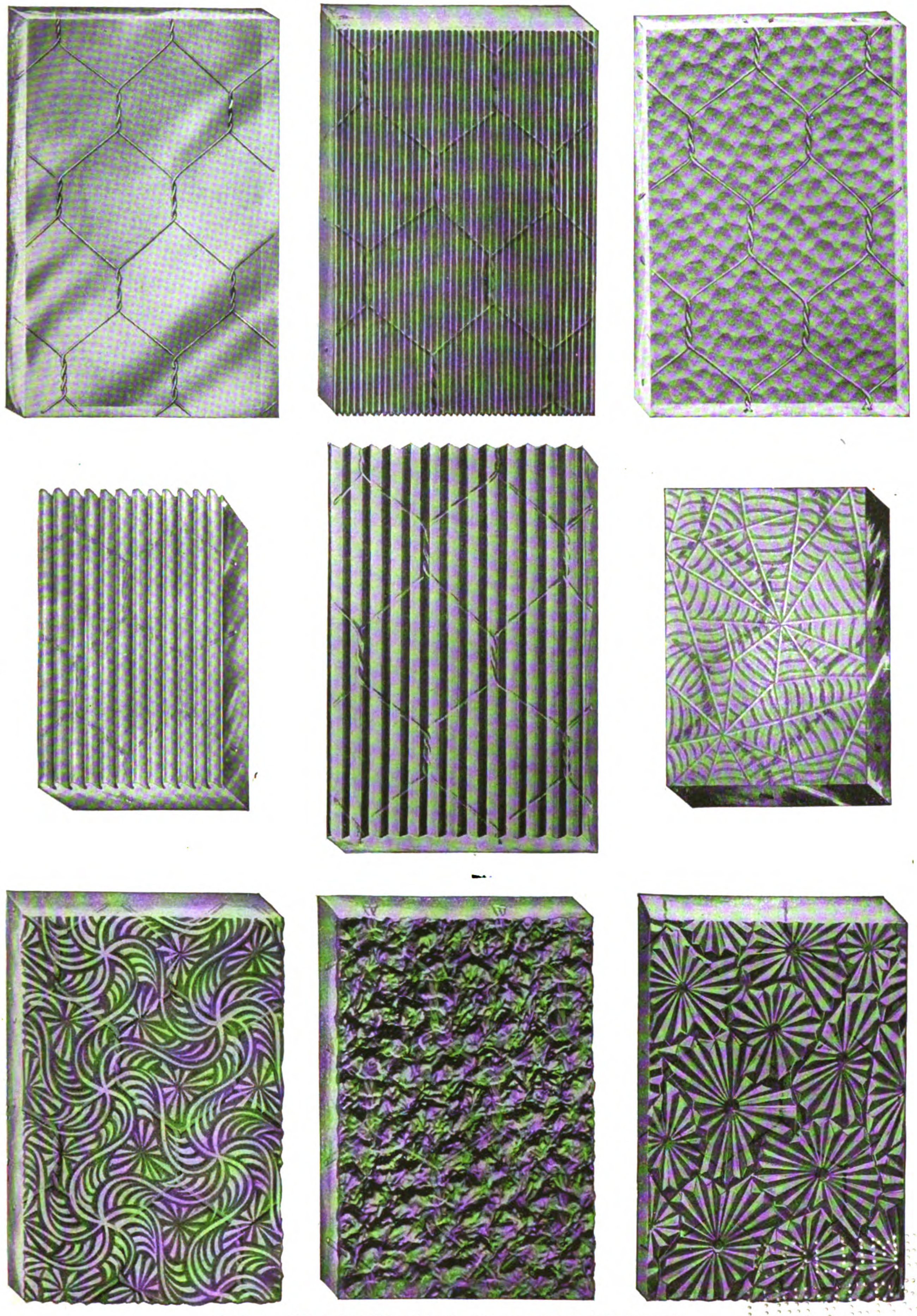
Building, $250,000, at .046	$115.00
Contents, $500,000, at .034	170.00
Total exposure charge	**$285.00**

It must be remembered that to the exposure charge saving, shown above, must be added the saving on the rate on building and contents, which is naturally reduced by proper exterior wall construction, and the lowered cost of maintenance. This total saving alone is sufficient reason for properly protecting the building against exposures, and when increased safety and the factor of immunity against the disturbance of business and destruction of lives and valuable records are considered, the fact that many buildings are to-day being constructed without such protection is almost incomprehensible.

Standard Protection Against Exposure

After a consideration of the need for proper pro-

VARIOUS TYPES OF WIRE GLASS



Courtesy of Mississippi Wire Glass Co. and Pennsylvania Wire Glass Co.

Courtesy of Detroit Steel Products Co.

Interior and exterior (below) views of exposure fire adjoining reinforced concrete and brick factory having window openings protected by solid steel sash and—

tection against exposures, and the value of such protection from the standpoint of increased safety, and lowered insurance and maintenance costs, it is but natural that the question of the selection of materials and devices should arise.

It is not the intent of this article to direct attention to the products of any individual manufacturer except in so far as these products serve as excellent illustrations of standard protection; but in a general way the elements entering into proper protection against exposure hazards will be considered for the guidance of those who contemplate building structures of the larger type.

In the first place, realizing that, as has already been said, the protection of every building is an individual problem, it is strongly recommended that architects and prospective builders get in touch with reputable insurance engineers who make a specialty of selection, design and installation of protective materials and devices in building construction. Their experience in this connection will prove invaluable in the matter of solving the problem of proper protection for individual buildings.

Wire Glass for Protection—

In the matter of protection against exterior exposures it will be noticed that the most striking feature is wire glass. Little need be said of the merits of wire glass for protection against spreading flames as this subject has been well covered in other sections of this article and throughout the illustrations. One point, however, of distinct interest and educational value to the prospective builder is that of polished plate glass versus wire glass. Recently in New York State, a bill has been passed allowing the use of plate glass on the street fronts of buildings in which manufacturing is done. This is a mistake and such a ruling should never have been allowed to pass.

Polished plate glass of the same thickness as ordinary wire glass, ¼ inch, cannot stand the test of fire, air and water and its use for protection of street fronts cannot be recommended. In the matter of street front protection, any exposure within 75 feet is a menace, and wire glass in metal frames is recommended; or in such buildings where there may be objection to wire glass from the aesthetic standpoint, automatic shutters should be used as protection against the existing exposures.

Wire glass, as shown on Page 285, is obtainable in any desired form and offers in addition to a high degree of fire retardency, a reduction of the break and falling glass hazards.

Window Protection—

As shown in the accompanying illustrations herewith, windows equipped with wire glass, which offer absolute protection against exposures are obtainable in many forms.

Window frames and sash of metal covered wood in any form should be avoided as they are subject to deterioration, due to dry rot of the wood and decomposition of metal and there is always a consequent lessening of the protective value of the window.

The best type of window for industrial buildings is solid steel sash with wire glass. This type of window in addition to its fireproofing features allows

Courtesy of Detroit Steel Products Co.

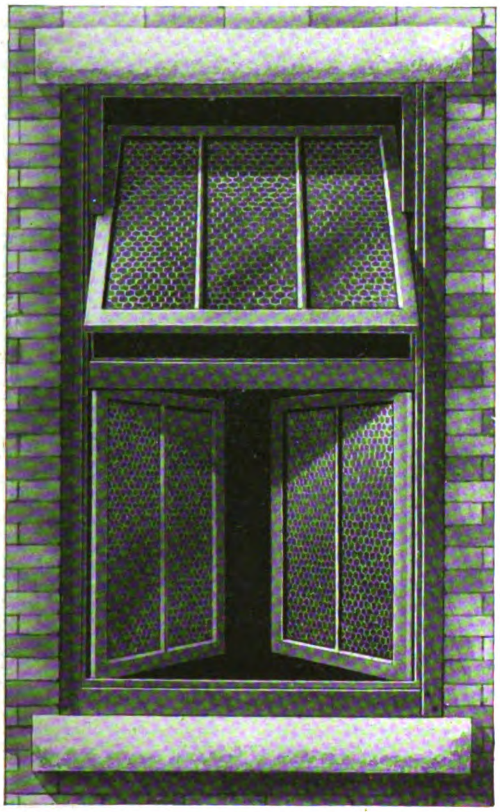
—wire glass. Piles of lumber and other highly inflammable material near exposed windows would have caused the complete distruction of this building by communicated flames had it not been for efficient protection

Willlis Mfg. Co.

Metal casement sash

large window areas and is not easily subject to breakage.

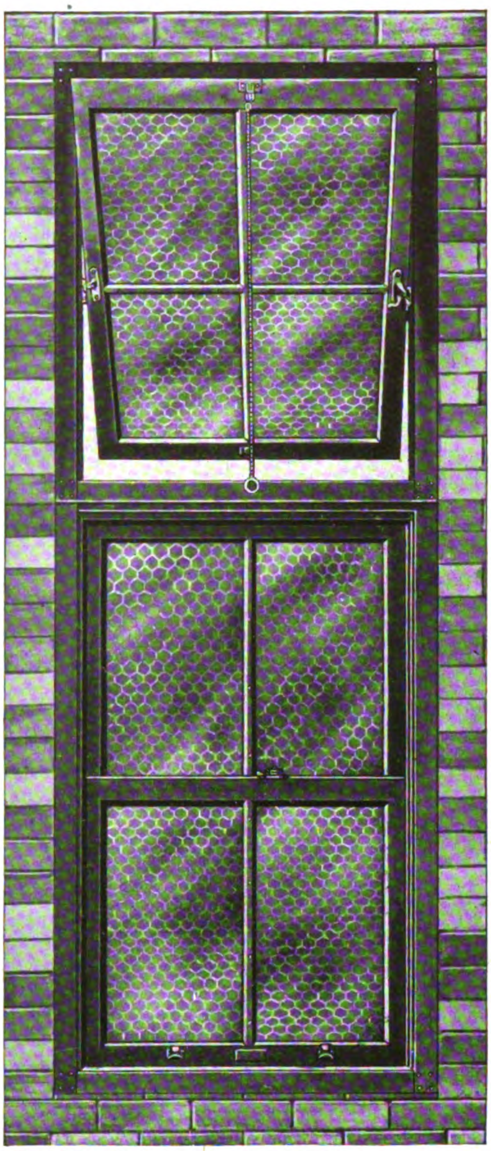
For all classes of buildings the hollow galvanized iron type of window, glazed with wire glass, is recommended. These come in both light and heavy gauge metal and are double hung, pivoted, or combination, as shown in the illustrations. All windows that are not readily accessible should be of the automatic self-closing type, operated by fusible links which will allow the closing of the window in case of fire.



Willlis Mfg. Co.

Metal windows—pivoted upper, casement lower

There are also on the market windows of solid steel sections which when glazed with wire glass have fire retardent and aesthetic value and the principal use of which is in high-class office buildings and other places where handsome exteriors are desirable.



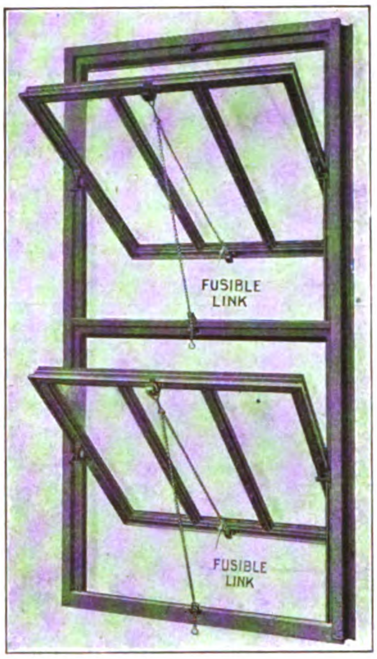
Willlis Mfg. Co.

Double window with transom

Those who contemplate the introduction of fireproof windows into their buildings should carefully inquire into the weatherproof qualities of those offered, some being considerably better in this respect than others.

Door Openings—

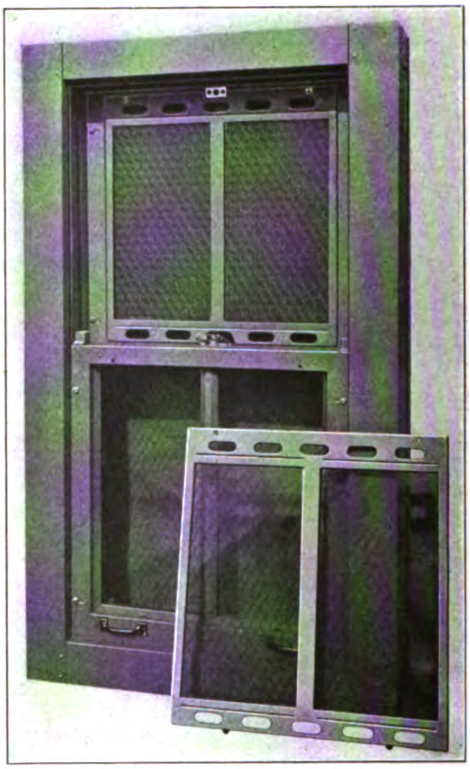
Fire doors used for the protection of exterior open-



S. H. Pomeroy & Co.

Double Vivoted Open

ings should be of the all-metal or metal and asbestos type, avoiding the use of tin-clad or kalemein doors because of probable deterioration. The automatic sliding fire door may be placed in a pocket to operate in time of fire, using wooden service doors; or the opening may be protected by an automatic rolling steel door. Where doors are exposed to the weather, those of bronze are often used although bronze or copper will not endure fire very long.



S. H. Pomeroy & Co.

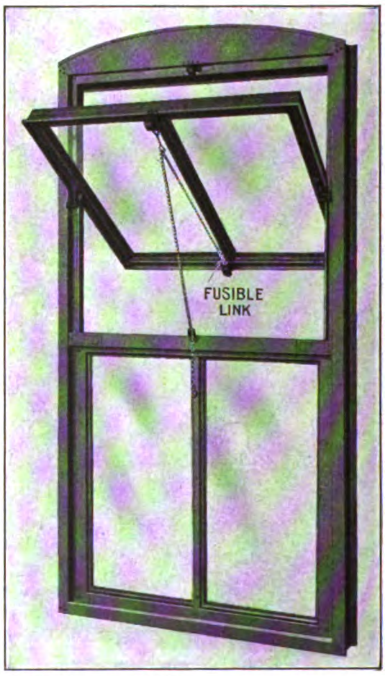
Double glazed adjustable weather guide

Fire Shutters—

There are five different types of fire shutters in use. The common "garden" varieties of kalemein or wood, tin-covered, and the sheet iron with strap iron

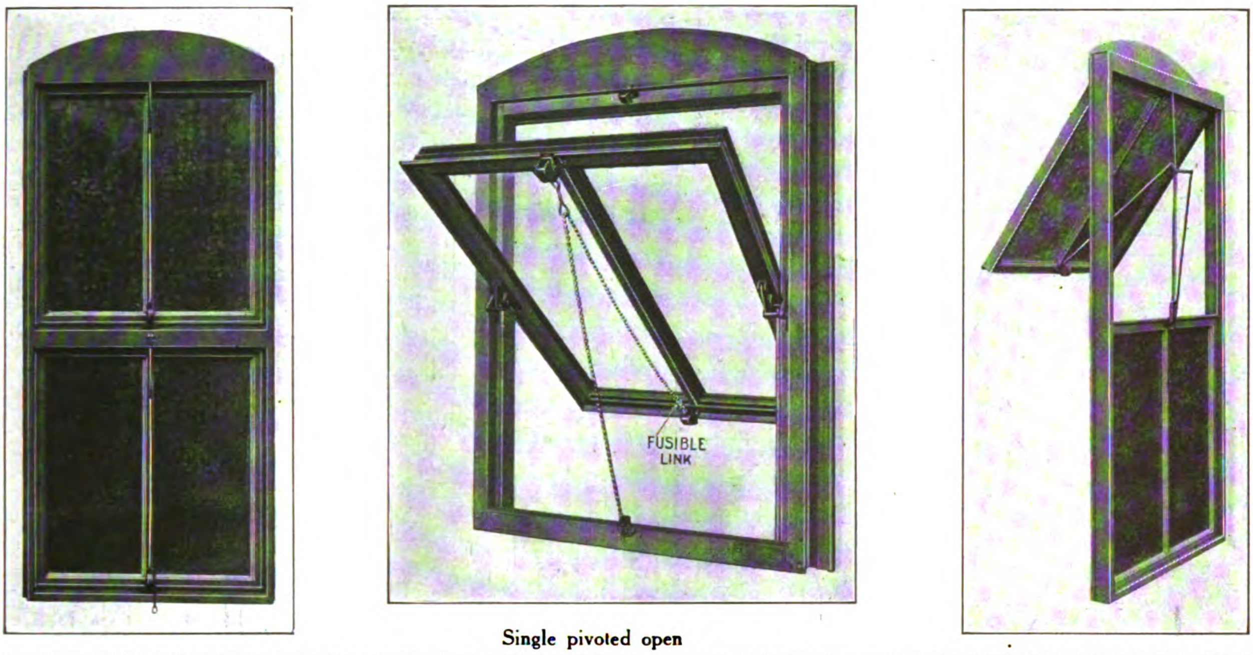
S. H. Pomeroy & Co.

Closed view—top sash pivoted, lower sash stationary



S. H. Pomeroy & Co.

Open view

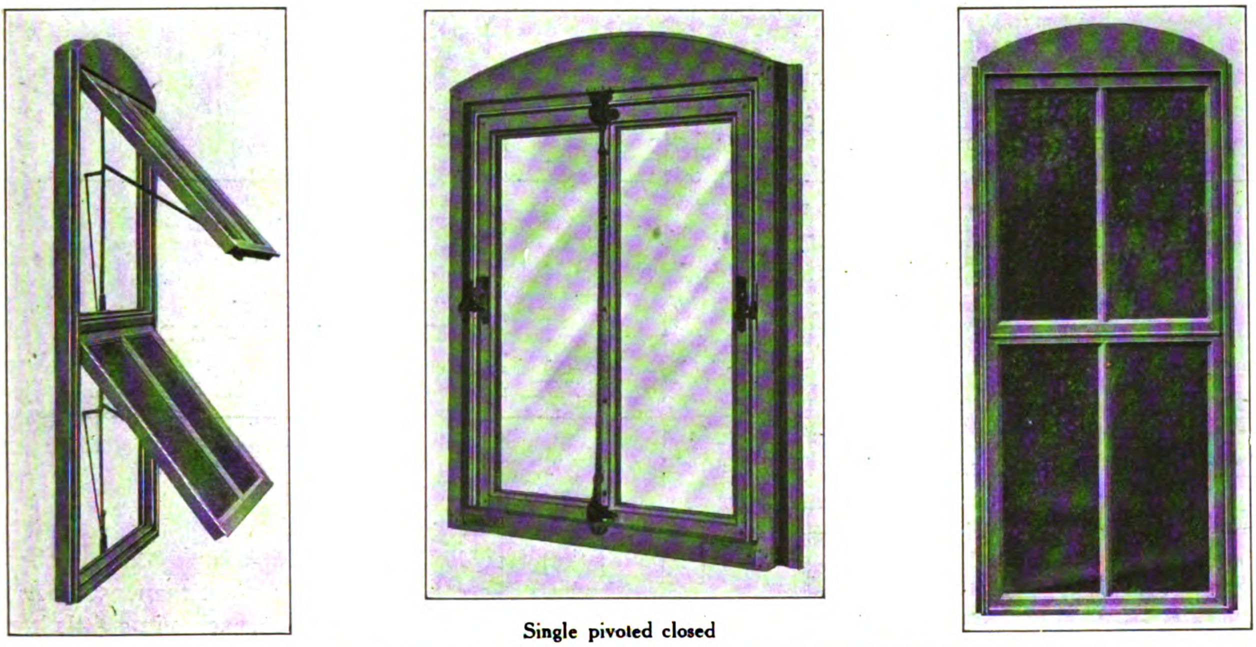


Single pivoted open

frames are both too poor to be considered, the former on account of its rusting out, and the latter as an unapproved though much used device.

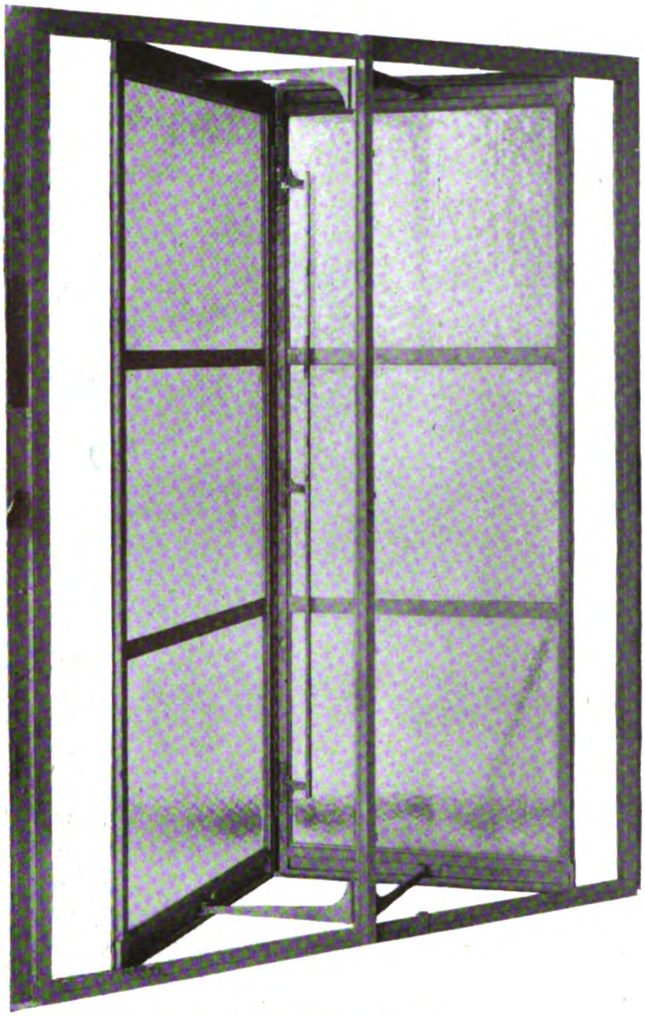
The other types are the rolling steel, both automatic and non-automatic; the corrugated steel with asbestos between the two sheets of corrugated metal, and the ordinary sheet iron shutter with angle iron frames made from underwriters' specifications. The rolling steel has the advantage of being easily applied to the wall of a building and easily raised and lowered. It can also be made automatic. As an automatic device when properly installed it is very dependable, though care should be given that it is not painted and rolled up before it is dry as the layers will stick and the shutter fail to work.

The double steel and asbestos type is especially useful owing to the fact that it does not radiate heat through it and even readily combustible material is safe within several feet, with a heavy fire burning on the other side. This shutter also can be made auto-



Single pivoted closed

On this page are shown various types of standard metal windows



Richey, Browne & Donald (The Browne Window)

An excellent type of window, solid steel or bronze, with wire glass. Convenient, easily regulated and cleaned

matic. The sheet steel and angle shutter has the one point of cheapness to commend it, and is frequently found installed where its efficiency is doubtful. There have been a great many fires where shutters have saved heavy losses and some where they have been of no value for the simple reason that they were open when the fire came. In order that the maximum efficiency can be secured all fire shutters should be closed nights, Sundays and holidays; and such other times as they can be without inconvenience to the occupants of the building. It is well also to have fire drills occasionally and drill the occupants of the building into closing the shutters. In a comparatively short time employees can be drilled to close hundreds of shutters in a few minutes. The importance of this form of protection has been demonstrated too often to admit of any doubt of its usefulness.

Open or Outside Sprinklers—

There is much that can be said about the efficiency of this type of protection although there are so many factors involved that the problem becomes quite complicated. In the matter of preparation of the building it is very important that every window to be protected must be glazed with wired glass, furthermore there must be water enough and of sufficient pressure to furnish at least 25-50 pounds at the highest sprinkler head. In calculating the amount of water necessary it must be borne in mind that each head requires about 20 gallons of water per minute and that if the building has a great many windows enough water will be required to drain a large water supply. It is better where the quantity of water is doubtful or surely not sufficient to omit this form of protection. As a matter of fact there are few places where it would be applicable.

S. H. Pomeroy & Co.

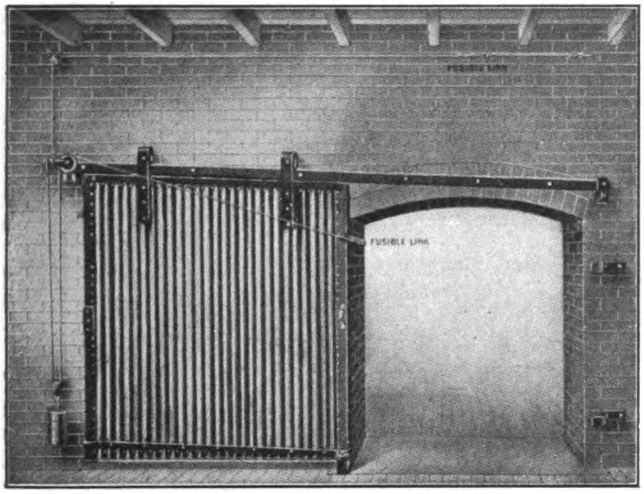
ANTI-PANIC EXIT FIRE DOOR

An exit door of metal and wire glass, equipped with brass "panic bolt." By pushing down on the push plate in the center of this bolt the doors are simultaneously unlocked and thrown open

Outside Water Protection

One of the most efficient forms of outside protection is that provided by a good water supply to a number of hydrants located not further apart than 250 feet and each supplied with hose and wrenches in a little house. The details will be supplied by the insurance organization having jurisdiction. This with an organization of

View of testing furnace employed at the Underwriters Laboratories, Chicago, Ill., for testing fire retardents. The standard test is to ascertain the effect of fire of one hour duration, with temperatures rapidly increasing to approximately 1,800 degrees, and sudden cooling of an application of 7/8 stream of water 60 pounds' nozzle pressure for one minute, to determine the efficiency in the reduction of heat transmission and radiation



Saino Fire Door & Shutter Co.

Single sliding metal and asbestos fire door

fire fighters from among the employees will be a great protection in the event of a fire.

Many matters such as the outside department; the number and kind of various fire fighting appliances; the proximity of the department; the water supply and its reliability are all features that must be considered.

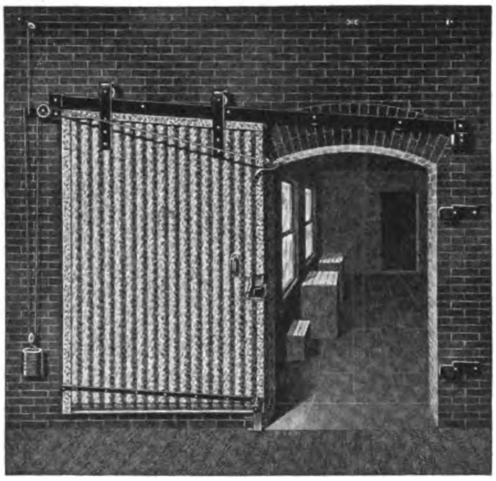
We earnestly urge very careful consideration and study of these problems, for a comparatively small outlay in the beginning will effect a comparatively large annual saving and safeguard the life and property concerned.

Approved Devices—

The question of insurance rating is one which has always been of more or less mystery to the average architect and builder. In this article the insurance rating regarding exposure charges was carefully worked out and submitted to the proper authorities as in the regular course of such work. Hence the allowances made, charges and deductions, are those made in the ordinary transactions of insurance rating and the example given is in no way exaggerated or overdrawn for editorial purposes. The exposure table shown is typical. It must always be remembered that where insurance reduction is an object as well as safety against fire, standard approved materials and devices must be used.

The insurance interests maintain a splendid organization in Chicago, known as the Underwriters' Laboratories, where practical tests of materials and devices are carried out. Here the manufacturer submits his product which is thoroughly tested and classified as to its fire-resisting qualities or extinguishing and protective value. When passed by the Laboratories it is known as an approved product and its classification and approval designated by specially designed labels. Various printed forms of matter covering various methods of protection and materials and devices are published by this organization, copies of which may be obtained from the underwriting body having local jurisdiction.

A careful reading of the foregoing article must have



Merchant & Evans Co.

Single sliding metal fire door

Kinnear Mfg. Co. Before Test

Rolling steel door before and after test. This particular door was subjected to fire at a temperature of 1,800 degrees. The illustration shows side of the door presented to the fire. These doors have been subjected to more severe and prolonged tests by the British Fire Prevntion Committee, of London, England, and have successfully met the conditions prescribed for the full protection in Sub Class B. In this classification—

shown that this subject of proper protection against exterior exposures is one of extreme importance in the field of building construction, and a subject deserving of much more time and attention than has generally been given heretofore by architects and prospective builders.

Merchant & Evans Co.
Single sliding metal fire door with wire glass panel

In an article to follow in a later issue of this publication the subject of protection against interior exposures will be taken up and the influence of such protection on the general construction and insurance rating of this building will be discussed.

At this time a feature which might have been properly considered in this article will be taken up—that of preventing the spread of flame from one floor to another through exterior openings.

This matter of spreading flames is one which deserves the serious attention of those who have to do with the making of laws and codes governing building construction. This is particularly true in the smaller cities which as in the case of Paris, Nashville and Augusta, have given far too little intelligent attention and careful study to the subject of so regulating building construction that the menace of spreading flames would be lessened by every new building put up.

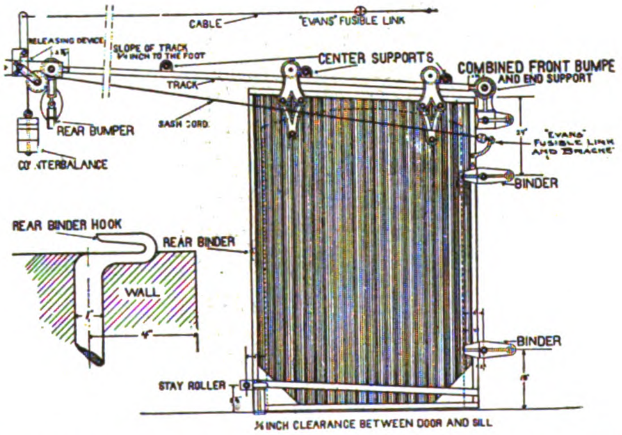
The value of proper protection against exposures as the most important factor in the prevention of conflagrations such as have visited many of our unfortunate cities is of paramount importance to those

—the retardents are subjected to fire for a period of four (4) hours, at a maximum temperature of 1,800 degrees Fahrenheit, and a stream of water of 60-pounds nozzle pressure for a period of five minutes. The doors successfully resisting the passage of both fire and water. Tests made in Belgium resulted in the approval of these doors and rolling steel shutters for the government warehouses

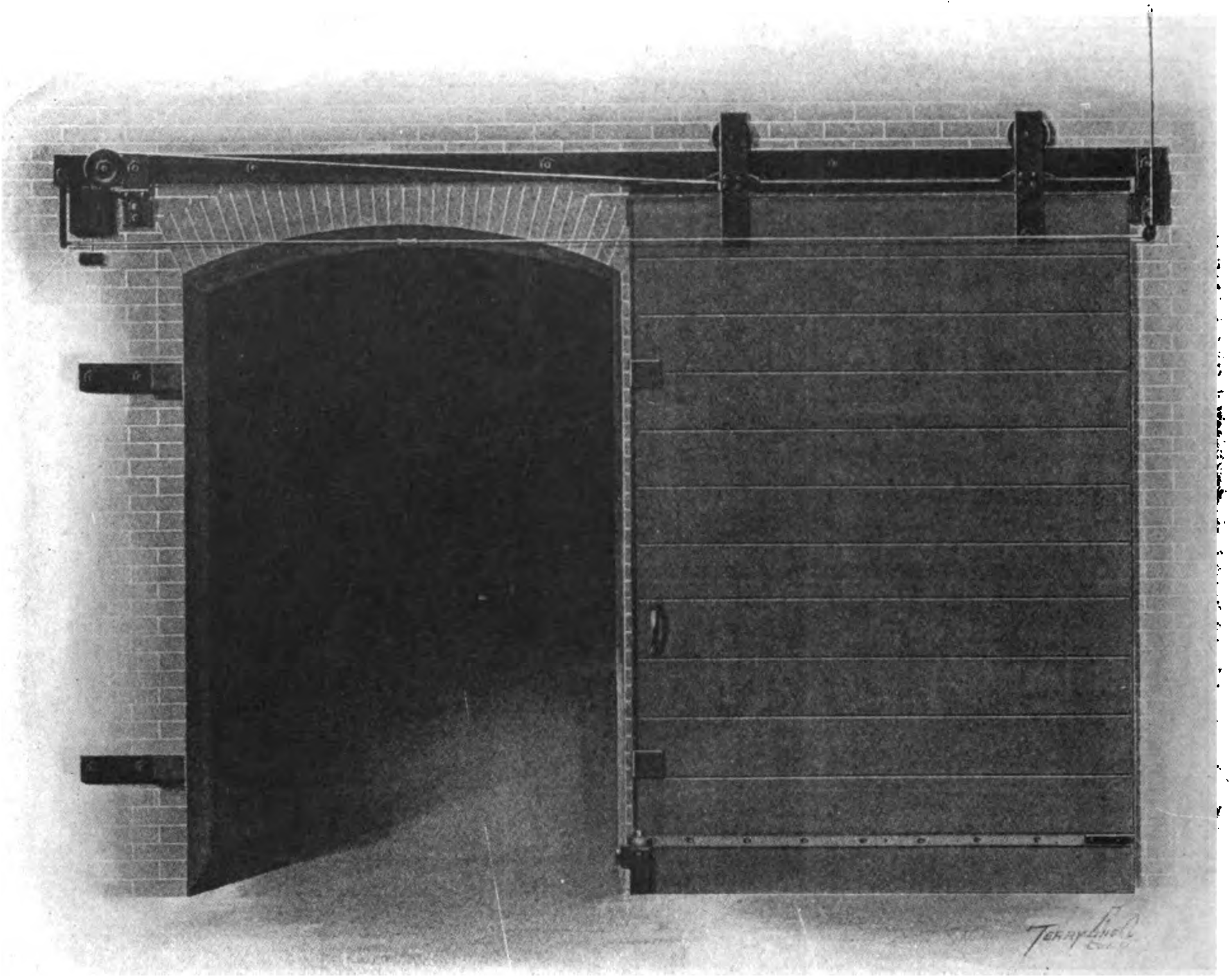
After Test

who dwell in congested residential or mercantile sections. To the lawmakers of our cities the task of reducing the conflagration hazard due to poor protection against exposures seems a gigantic and almost impossible accomplishment. There is only one solution to the problem and that is to enforce proper protection in all future building construction. Every properly protected building exterior reduces the conflagration hazard in the neighborhood in which it is located. Many of the photographs with which this article is illustrated show clear eveidence that proper protection of the buildings in question not only saved their contents but caused them to act as fire-walls, barriers which allowed the extinguishment of the adjoining fire and kept it from spreading as the nucleus of a disastrous conflagration.

This fact alone should be of sufficient weight to convince the makers of local building laws and codes to begin a long neglected campaign for preparedness against the conflagration hazard in their own city or town. If proper protection against exposures is not now enforced in *your* town or city, and there are so



The application of approved hardware to single sliding door. This cut shows the gussett plates in each corner—at the bottom of the door. Gussett plates are placed internally instead of on the exterior, and the corrugated panels are brought all the way down to the bottom of the door so as to eliminate dust pockets



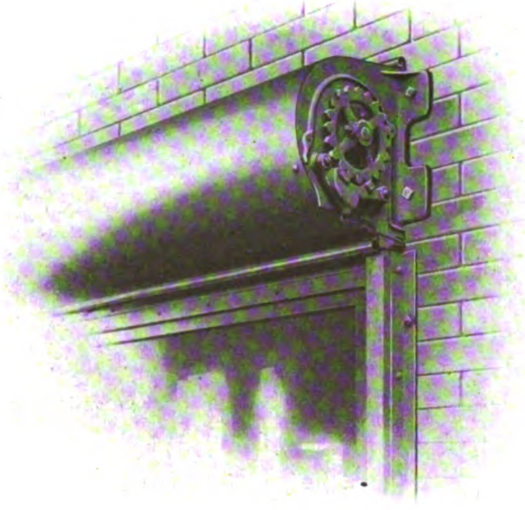
Kinnear Mfg. Co.

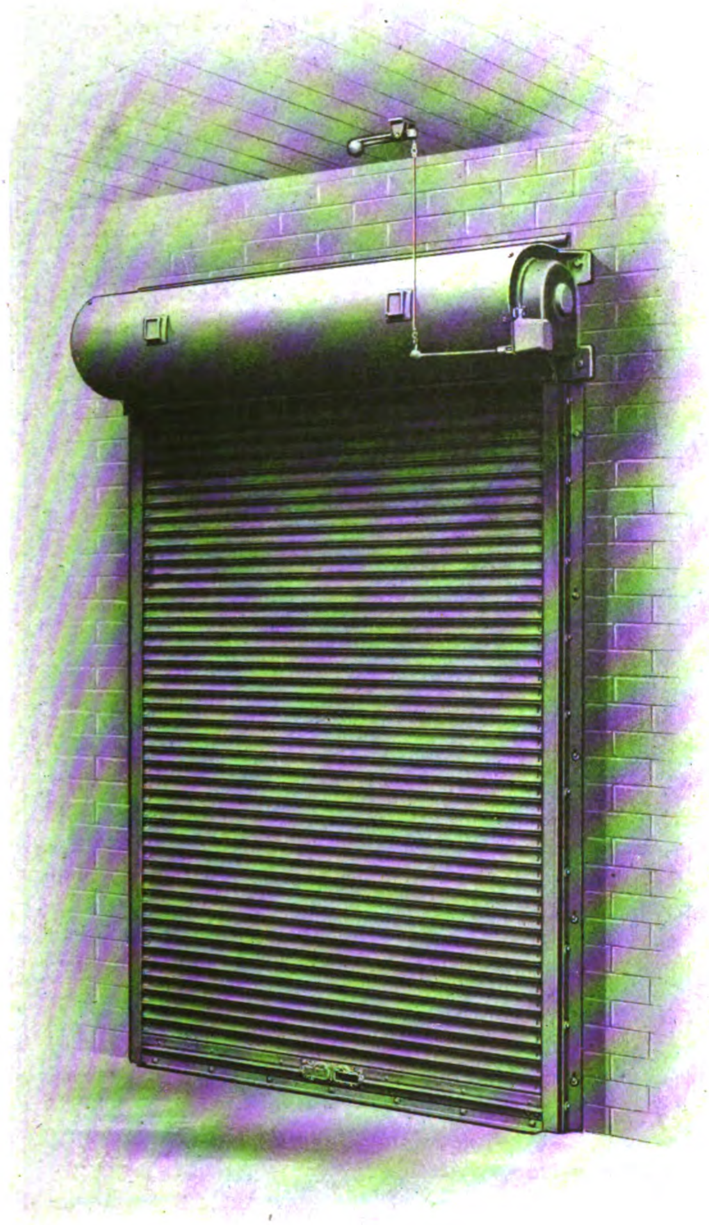
An excellent fire door composed of steel frame, with interlocking sections, horizontally assembled, constituting a cellular structure; the filler material is non-combustible and does not produce smoke or gas when highly heated. These sections are securely held by tie rods, which are connected to skeleton frame at the top and bottom. The sections are tongued and grooved. This formation insures correct alignment, and resists any tendency to separate by bulging. Radiation is practically eliminated

few localities in which it is enforced, then it is time that you should agitate this subject. There is no longer any excuse for ignorance of the fire hazard on the part of the people of this country—no excuse for the lethargy and even antipathy with which the subject is greeted. We of America have taken the fire loss as part of our national existence. We expect fire—we suffer its horrors patiently—we pay the exacted tribute without a murmur. Our fire-fighting organizations and apparatus are superior to those of any other country in the world—superior because we need *protection* against fire more than any other nation. Our fire losses in America far exceed those of Europe—and why? Because we fight fire *after it has started and gained headway* instead of rendering it harmless by keeping fuel in the shape of inflammable materials, out of our building walls and floors and off our roofs and by having at hand the means to extinguish incipient blazes automatically or manually. The old proverb could well be changed to fit this subject and made to read:

"An ounce of prevention against fire is worth a ton of fire-fighting apparatus!"

In conclusion there is little to say except to strongly advise those who contemplate the construction of any building to give more thought and attention to the subject of *fire-prevention* than has usually been done heretofore. Build to prevent fires! Use standard materials and devices, combining them in a sensible manner which will produce a structure which is consistently firesafe. We spend millions for fire protection. Proper protection of exterior openings in building construction is the best of all safeguards against sweeping conflagrations; and removes 60 per cent of the fire-danger in the individual building. Such protection is surely worth while.

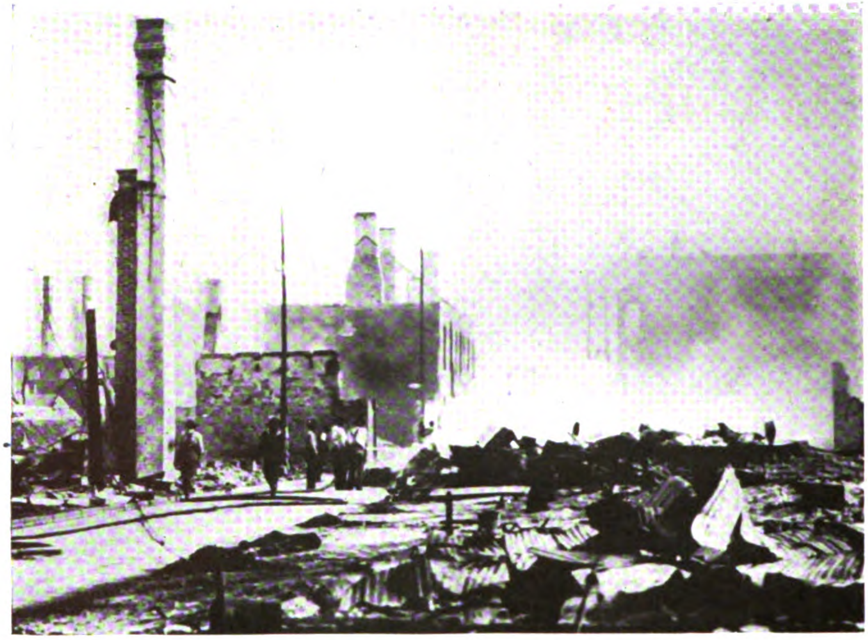




The rolling steel shutter is normally open and is closed by a releasing device actuated by fusible links. It has distinct value as a protection against serious exposures. At the left is shown automatic steel shutter in normal position —above shows mechanism of automatic release

Kinnear Mfg. Co.

COLUMBIA UNIVERSITY

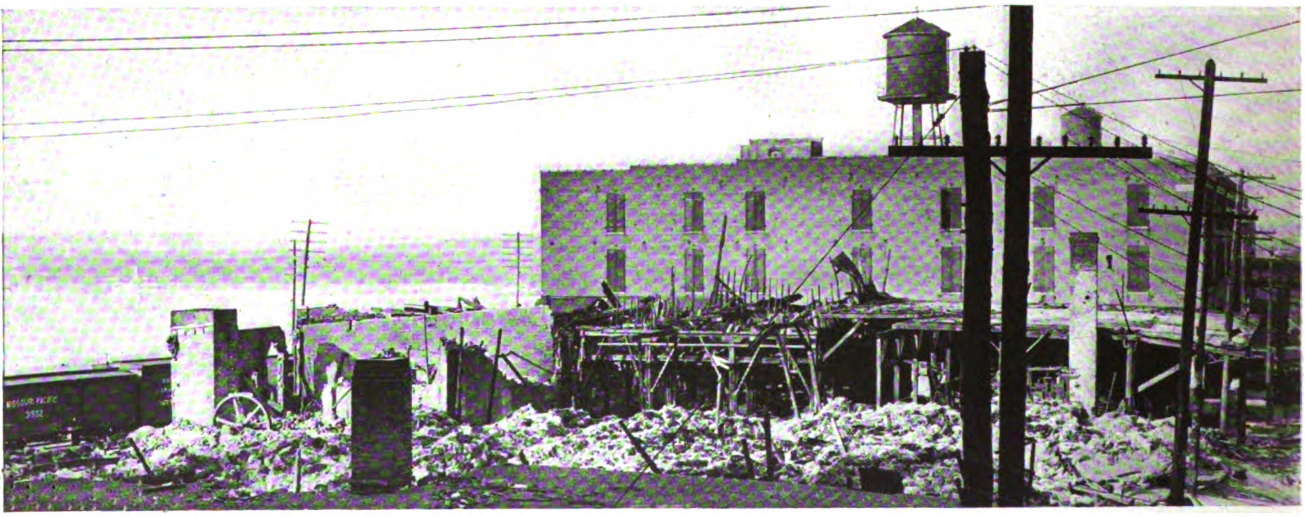


The result of non-protection of exposures at Paris, Tex.

Get after the wood shingle roof in your town—and stop the erection of large buildings having windows of thin glass and wood, which are invitations for fire to enter or belch out of the building, forming paths along which it may readily travel.

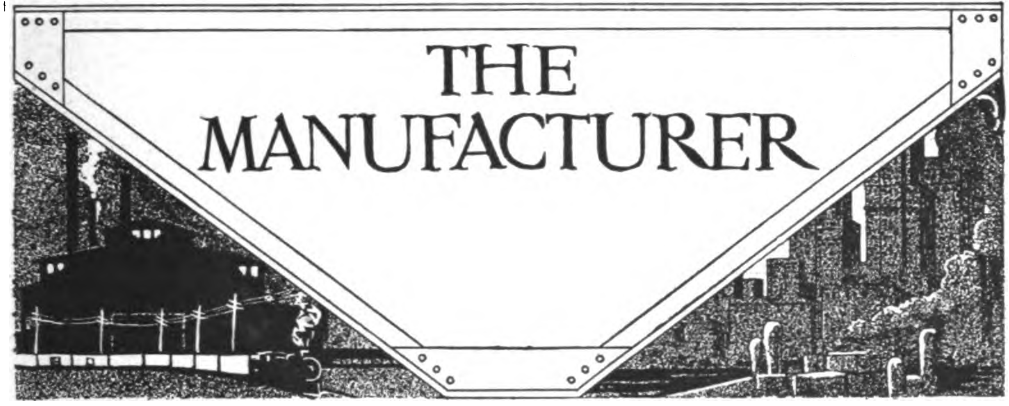
Conflagrations and disastrous spreading fires will only be prevented by a failure to provide wooden paths along which they may travel from roof to roof of dwellings and through exterior openings of large buildings; and a realization that fire will not be stopped by flimsy barriers of wood and tin. The so-called "fireproof building," with its trim and doors of wood or metal-covered wood, must go.

An article on the subject of protection against interior exposures will appear in an early issue of CONSTRVCTION



Saine Fire Door & Shutter Co.

Excellent protection afforded by metal and asbestos shutters



¶ Co-operation is sounding a new note of progress across the vast fields of American industry.

¶ Here is a great undeveloped market for your product.

Lumber Spokesman Effectively Answered

In the course of an editorial in a late issue of the *American Lumberman*, scoring the manufacturers of firesafe roofing material for their temerity in emphasizing the menace to life and property of wood shingle covered structures, reprint was made of a letter previously written by Keasby & Mattison Company, of Ambler, Pa., to various firesafe building material dealers throughout the United States, suggesting the desirability of forming a permanent organization for the advancement of their general interests, which, be it said, are closely interwoven with those of the public at large.

Prompt challenge of the statements and deductions of the journal in question was made by R. T. Gebler, of the Keasby & Mattison Company, whose interesting and logical reply to the *American Lumberman* is reproduced herewith:

"In your issue of April 15th, 1916, you reprint a letter signed by Mr. C. J. Stover, vice-president of this company, and addressed to about 150 of the larger manufacturers of non-combustible building material and fire fighting devices.

"You seem to be peeved over the fact that here was a bold attempt to create an organized effort to fight wood shingles and other combustible materials. Perhaps it was. But do you know that we non-combustible manufacturers have no organization? Do you also know that the lumber interests are thoroughly organized to oppose any legislation that affects their interests and whatever the manufacturers of non-combustibles have done to offset your work has been done individually and in paid advertising space,

"We know, of course, that it is highly desirable that Mr. Average Citizen should live in blissful ignorance of the fire hazard—for the extent of his unpreparedness is the only limitation of lumber profits. And isn't your opposition to building material that *will not burn* an open admission that you want the builder to buy material *that will burn?*

"Isn't your opposition to *safe building* a public confession that you advocate *unsafe building,* and isn't your organized effort to thwart the work of the officials an admission that you thrive on a condition that spells property loss and the loss of life?

"And have we committed any grave offense in wanting people to think about fire prevention in order to sell more of our goods, when you are organized to make them forget it in order to sell more of yours? The very emphasis you give the words *fire prevention* in your reprint adds just that much more emphasis to your desire to oppose *fire prevention.*

"We wonder who the shoe pinches most.

"However, your attitude is excusable because it means existence to you—and it listens good to your advertisers. The brewers, of course, want us to drink all the booze we can crowd under our skins. The heroin and hop peddlers profit on the wrecks they create. The cigarette people want us to smoke the dope sticks a pack at a puff. Of course these people oppose the antis in any activity aimed at a curbing of their power.

"A wood shingle will burn. We know that. You know it, and the poor devils who have learned it first hand are not ripping out any cheers for the thing that knocked them down.

"The fact that you have opposed our efforts is as helpful as it is amusing. We intend to go on fighting the Anti-Fire Prevention movement with every faculty we have; for as long as a man lives who is impelled by pride to protect his property and by love to surround his loved ones with every precaution against fire, just that long will we sell fire-prevention building material and fire-fighting devices.

"Thank you for the publication of our letter. It helps the cause wonderfully, and depend upon it we shall make good use of it. A little opposition to organization—when it comes from the organ of an industry that used organization very efficiently—is a boost, not a bump."

BUILDING LAWS AND ORDINANCES

Atlanta Awake to Wood Shingle Roof Danger

For an otherwise unusually progressive community, Atlanta, Ga., has been singularly negligent thus far in safeguarding itself against the menace of the wood shingle roof, despite the clear warning repeatedly given by Fire Chief W. B. Cody. That the authorities are at last awake to their responsibilities in this direction is attested by the ordinance now before the council and which, it is intended, shall become effective January 1, 1917.

The ordinance sets forth that all buildings in the city limits except dwellings, frame buildings, buildings not exceeding two stories in height or thirty feet and twenty-five hundred square feet in area, providing the same are not used for factories, warehouses or mercantile purposes, shall have roofs of tile, brick, slate, tin, iron, asbestos or built-up felt roofing with gravel or slag surface, which shall rank as class A or class B under the test specifications of the National Board of Fire Underwriters.

The roofing shall be of such material as not to rank lower than class F under the test specifications of the underwriters.

It further provides that a layer of felt at least 1-16 of an inch thick shall be placed between the metal roofing and the supporting woodwork. The wooden plank and sheathing of roofs shall not, in any case, be extended across side or party walls.

The ordinance does not prohibit the repair of wooden shingle roofs now existing, providing the building is not increased in height and provided further that repairing shall not be so extensive as to amount to a renewal of the roof.

New York's Revised Code

All revisions of New York's Building Code passed by the Board of Aldermen prior to December 31, 1915, are to take effect March 14, 1916, have now been printed in handy form by the Bureau of Buildings, Borough of Manhattan. Remaining sections of the old code are being revised, and when this work is completed they too will be printed for proper circulation.

Poor Construction at Oklahoma City

Oklahoma City, Oklahoma, in the opinion of engineers of the National Board of Fire Underwriters, presents a serious fire hazard, mainly because of the poor type of construction of many of the older mercantile buildings in the city. These, for the most part, are large to an excessive area and, once afire, would offer admirable flues for the rapid spread of flames. An encouraging feature of the situation, however, is the presence of a number of modern fireproof buildings so grouped as to act as a pronounced barrier to the spread of flames, and offer a fine vantage ground from which to fight a threatened conflagration.

Meriden, Conn., Should Extend Fire Limits

Fire Marshal Trudeau, of Meriden, Conn., is in favor of materially extending the present fire limits of the city, holding that the erection of large wooden structures just outside the prohibited zone is a standing menace to the business section of the community. A considerable element of the citizens of Meriden are in accord with the marshal's views and will appeal to the council to take action in such connection.

Inspection Service in Kentucky

The Kentucky State Fire Marshal and his entire staff of assistants recently held a conference at Louisville with the State Insurance Board, and discussed the new requirements for electric wiring, and the best means of enforcing the State and local building ordinances with a view of reducing the fire hazard.

Garage Regulations at Albany, Ga.

The city council of Albany, Ga., has passed an ordinance prohibiting the location of garages or repositories for automobiles under, in or immediately adjacent to buildings occupied by theaters, hotels, boarding houses, clubs or other places of public gatherings.

Progressive Davenport

Animated by a desire to have their city as well safeguarded against fire as it is progressive in other respects, the authorities of Davenport, Iowa, had been working intelligently and consistently to that end for months past, with the result that the community is now distinctly "on the map," so far as fire prevention is concerned.

This desirable result was attained by amending the former building code along lines suggested by the underwriters, and by adding to the equipment and personnel of the fire department. All horse-drawn fire apparatus has been replaced by motor engines and trucks, thus providing for the more speedy attendance at fires and the covering of extended area.

A notable provision of the new building ordinance, and which passed the city council without a dissenting vote, is the virtual abolishment of the wood shingle roof within the city limits. In future a wood covering will not be tolerated, even upon "a little wood-shed." This advanced and sensible action by the Davenport authorities was not taken as a result of the recent sweeping Southern conflagrations, in which the menace of the wood shingle was so strikingly emphasized; but was the outcome of the carefully tabulated experience of the local fire department over a given period.

From the data thus compiled the subjoined results were disclosed:

Percentage of roof fires caused by wooden shingles as compared with the total number of roof fires:

Sparks from chimneys	75
Chimneys burning out	41
Defective chimneys	4
Sparks from railroad engines	2
Sparks from bonfires	4
Exposures to other fires	10
Overheated stove pipe	1
Roof fires, starting in attic due to other causes	24
Total	161
Percentage of roof fires due to wooden shingles	85

Percentage of roof fires caused by wooden shingles compared with the total number of fires in dwellings, barns and sheds:

Total dwelling, barn and shed fires	200
Fires caused by wooden shingles	137
Percentage	.685

Percentage of roof fires caused by wooden shingles compared with the total number of fires in buildings, no matter what class of construction:

Total number of fires	275
Fires caused by wooden shingles	137
Percentage	.498

In order not to bear too hard upon the wood shingle dealers of the city, four months from the date of the enactment of the ordinance was given them in which to dispose of the supplies then on hand, after which period the measure will be rigidly enforced.

Commenting upon the present condition in Davenport, in the bringing about of which he bore a prominent part, Building Commissioner R. C. Graham said in part: "We feel that we have taken a progressive and sensible step in doing what we have, and are convinced that nothing but good can come from it. We point with pride to the fact that Davenport, with a population of 50,000 persons, being classified as a second-class city by the Iowa Rating Bureau and by the National Board of Fire Underwriters, and I think you will concede the statement that communities such as our are few and far between."

Want Jersey City's Code Changed

Asserting that the present building code of Jersey City "was so poorly drawn that it was almost impossible for anyone to interpret it correctly," a number of citizens of the community are strongly agitating for its complete revision.

Improvement at Hartford

Steps are being taken to improve the building code of Hartford, Conn., along lines shown to be desirable by late changes in the building world.

Fire Limits Extended at Houston, Texas

Under a recent amendment to the building code of Houston, Tex., the former area in which the erection of wooden structures was prohibited, has been greatly extended.

Labor Opposed to Wood Roofing

At the Texas State Federation of Labor convention, held at Houston a short time ago, the subjoined resolution was adopted:

"Whereas, During the past year much property and many lives have been destroyed by fire within the confines of our State; and

"Whereas, We believe it to be the duty of the Texas State Federation of Labor to do at all times whatsoever it can to protect life and property, and knowing that danger from fire can be reduced to a minimum by the use of some non-combustible roofing material, be it

"Resolved, That the incoming legislative committee of the Texas State Federation of Labor be instructed to make a special study of this condition and present a bill to the next Legislature that will afford the citizens of Texas adequate protection."

Recent Building Projects

Baltimore architects are preparing competitive plans for a new parochial school for the S.S. Philip and James Church, on the northeast corner of Maryland avenue and Twenty-ninth street, Baltimore. The intended building will cost about $50,000.

J. Henry Miller, Inc., Baltimore, has the contract for erecting the Young Women's Christian Association at Highlandtown, Md. The building is to be of brick and stone, and will cost nearly $50,000. Oliver B. Wight is the architect.

Five million dollars will eventally be spent by the Ford Company, of Detroit, Mich., in the erection of a group of manufacturing buildings at Kearney, N. J. The first unit of the plant, to cost $1,000,000, will be started very soon.

Endress & Watkin, of Austin, Texas, have prepared plans for a three story and basement building to be erected at Houston for the Southern Drug Company. When completed, the structure "will be as near fireproofness as the ingenuity of man can make it." Gray brick with stone trimming will be the material used chiefly in its erection. Interior fire safeguards will include automatic sprinklers and automatic fire doors.

The cost of the addition to the St. Paul Sanitarium at Dallas, Texas, will be close to $170,000, without equipment. The structural material to be used in the building will be largely brick and concrete with roof of Bangor slate. J. Ed Overbeck is architect, and H. J. Curtis, both of Dallas, the general contractor. The structure is to be fireproof throghout.

Attractive Building for Detroit

What it is claimed will be one of the finest structures of its kind, west of New York, is now in process of erection at Detroit. Known as the Book Building, the structure, fronting on Washington boulevard, will be thirteen stories in height and will cost about $750,000.

Of the Italian renaissance type, the building will have an exterior of either marble or stone, and "absolutely no wood will be used" for any purpose in its construction.

There will be six stories with Washington boulevard frontage. The second and third floors will be devoted to exclusive shops surrounding a Keyler dome of glass rising to a height of three stories. Offices will occupy all the upper floors above the third.

The main entrance and the entrance to all the ground floor stores will be in bronze.

Crittall steel windows will be used throughout the first three floors and Brown windows on the upper floors and all doors will be steel in battleship gray.

The entire interior finish of the first three floors will be Botticino marble with Traertine stone floors in the corridors, while Tennessee marble will be employed for corridor floors and Vermont marble for the wainscoting on the upper stories. All office floors will be cement.

The elevator service will include four passenger and two freight elevators, the shafts to be of bronze up to the fourth floor and steel above.

Louis Kamper is the architect and Walbridge & Aldinger, both of Detroit, the general contractors.

Wooden Shack Caused Bad Fire at Raleigh

Fire at Raleigh, N. C., on the second instant, seriously threatened the business section of the city, a happening that was averted only through the unusually good work of the local firemen, aided by several engines hastily summoned from Durham. The damage resulting from the fire is placed at $150,000, and substantial as is the amount it might easily have been many times larger, and would undoubtedly have been so had not weather conditions all been in favor of the fire-fighters.

Starting in a frame stable, the fire quickly spread to the nearby three-story brick business block of Job B. Wyatt's Sons' Company, which was completely gutted, as was also a two-story brick structure owned by Frank Stronach.

As a result of the fire there will probably be a complete inspection and the condemnation of a number of wooden buildings now standing in the mercantile section of the city, and which constitute a severe fire hazard. Building Inspector Mangum is on record as having recognized and protested against the danger in question, but his warnings were unheeded, and he had no authority under the law to enforce them.

Speaking of the fire, Captain Sherwood Brockwell, deputy State Insurance Commissioner and a former fire chief in Raleigh, said in part: "The firemen were making good progress against the stable fire when the flames in the rear were licked up and carried by the wind around the rear corner of the Wyatt building, and there found the greatest aider and abettor to fire ever known—unprotected windows." Once gaining an entrance the flames rapidly destroyed the Wyatt building, together with the brick structure nearby.

Wooden buildings, located in the congested centers of cities, is no uncommon sight in the South, and elsewhere throughout the country, for that matter, and the sooner the public authorities recognize their potential fire danger and order their removal the better it will be

Rebuilding in the Conflagration-Swept Cities

ALTHOUGH comparatively few contracts for the erection of new homes or mercantile structures have yet been awarded in the conflagration-swept cities of Paris, Texas; Augusta, Ga., and Nashville, Tenn.; and it is highly improbable that reconstruction work will be actively underway for some weeks and perhaps months, the delay must not be attributed to lack of intent or to financial ability on the part of interested property-owners, but rather to their sensible determination to wait until the comprehensive surveys in progress at all three centres shall have been completed, when individual plans can be formulated much more intelligently than is now possible.

At all three cities committees were selected immediately after the fires to act in conjunction with the public officials in preparing plans for a general rearrangement of the burned areas; the scheme embracing the creation of parks, widening of streets, defining building lines, fixing in broad terms upon the general types of structures for the different localities, and kindred matters, all tending to make the rebuilding more substantial and harmonious than would otherwise be the case.

Citizens and Public Officials Co-operating

Through the enactment of ordinances and by direction of responsible department heads, the municipal officials are co-operating in the broadest and most effective manner with the citizens' committees, and the result unquestionably will be that the now devastated sections of Paris, Augusta and Nashville will later prove to be their most attractive areas.

New building codes promptly adopted in each of the cities will insure the future erection of structures along fire-safe lines; the present laws prohibiting absolutely the use of the fire-feeding wood shingle roof and the well-nigh equally dangerous frame extension to brick and stone structures.

At Paris, the City National Bank has closed a deal with the Crook-Record Company for the purchase of forty feet of its lot on the south side of the square next to Twentieth street and running back 108 feet. The bank will begin at once erecting a reinforced concrete office building several stories high. The Crook-Record Company, which will also rebuild right away, will still have sixty-five feet frontage on the square and will run back and front thirty feet on Twentieth street. The Crook-Record building will be three stories and a basement. It is expected to be occupied by October 1.

The Odd Fellows Lodge is having plans prepared for rebuilding on its lot at the southwest corner of the square. The building will be three stories and its cost will be about $30,000.

Public buildings destroyed, including the post office and the city hall, are to be rebuilt shortly.

Augusta property owners in the mercantile district are deterred from prosecuting rebuilding plans just now for two primary reasons, i. e., the management of the Chronicle and Empire Life buildings, the most important in the city, have not fully adjusted their respective claims against the insurance companies, and hence are unable to fix their programs, and another and more pressing reason is that a rearrangement of the wholesale and the warehouse sections of the city is under review, and if it be decided to change either, that fact would have a great bearing upon the plans of many of the merchants.

In almost every instance private dwellings that were burned will be replaced, although it is highly probable that a new location for the more pretentious structures will be selected.

Tentative plans in large number have been outlined, both for residence and mercantile buildings, but very few have been completed, nor are they likely to be until location areas are fixed upon by the joint committee to whom the matter was referred.

While new building is unusually active in Nashville the structures underway are practically all in localities not visited by the fire of March 22. In the latter section little has been done thus far, Building Supervisor J. H. Yeaman stating that "the owners of residences and other property seemed to be waiting to ascertain definitely what part of the area shall be acquired for park and what for school purposes, before deciding on what they shall do with their land."

* * *

Question Fire Marshal Act

Challenging the validity of the North Dakota statute, which gives the State Fire Marshal the power to condemn and order removed buildings considered dangerous, a citizen of Devils Lake has appealed to the Supreme Court.

San Jose, Cal., Penalized

A 15 per cent advance in rates at San Jose, Cal., became effective on May 15th, because of the generally unsatisfactory fire conditions of the city, and the unwillingness or inability of the authorities to make the improvements recommended by the insurance men.

SAFE HOMES

A DEPARTMENT OF "CONSTRVCTION"

Devoted Exclusively to the Interest of the Home Builder

Edited by Ralph P. Stoddard

"Brick Homes at Low Cost"

THIS is the title of a book just issued by the face brick manufacturers of Ohio, which has proven one of the most popular class publications ever produced.

Opportunity to sign for the book was given at the recent Complete Building Show in Cleveland. Close to ten thousand expressed their desire to have this little hand-book at that time. Since its being issued, with subsequent frequent mention in newspapers and magazines, several thousand more requests have been received for it.

It has had, in addition, the advantage of word of mouth recommendation, of one person showing it to a neighbor, until now the office of The Society Advocating Fire Elimination, 356 Leader-News Building, in Cleveland, is having from fifty to two hundred requests daily for it, both in person and by mail.

Owing to the exceptional practicability of the plans for houses of low price shown more than twenty-five persons have expressed their intention of building one of the little homes shown in this book during the coming summer. Ground already has been broken for one.

Expressions from those who request the book are to the effect that the combination of practical plans, accompanied by bids of reliable contractors, coupled with the fact *The Safe* is providing working drawings and specifications of all buildings shown, is exactly what they have sought for years.

The home building public is anxious to build safe; but until this book was published there never has been a practical publication which gave them, under one cover, all the necessary information.

If you are one of those who have missed getting this interesting and valuable book, write for it at once.

Why a Safe Home

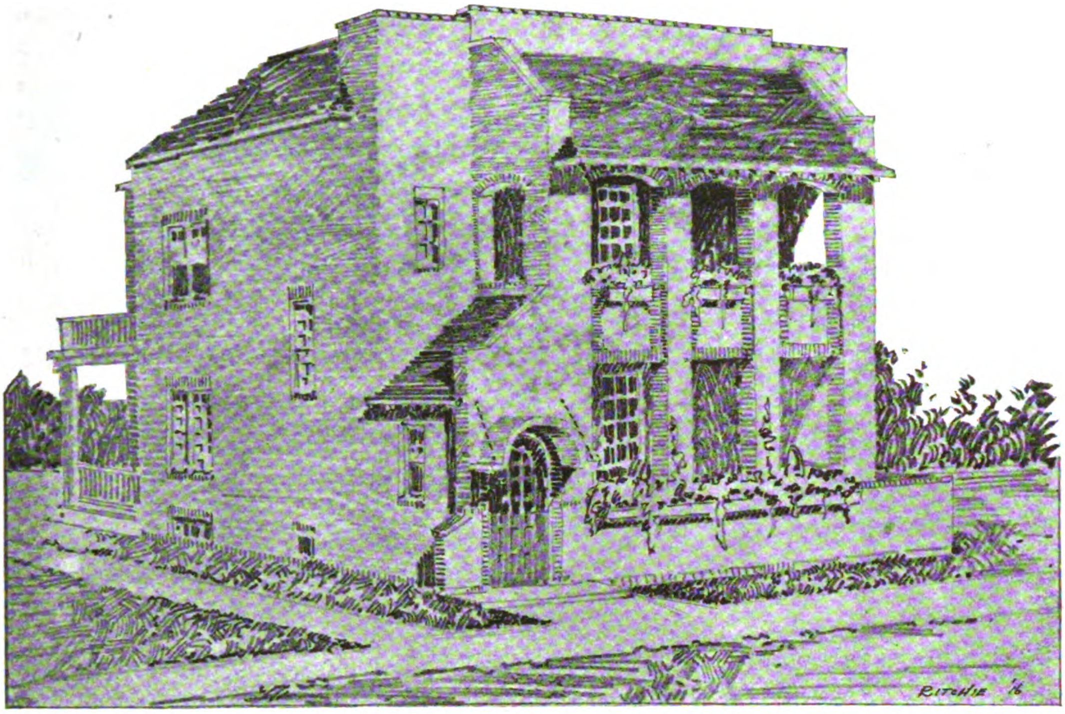
There is an awakening interest throughout the United States, in the cost of safe and permanent building. While for years the economy of safe building has been recognized in all types of commercial and public buildings it is only recently that it has been considered in connection with home building.

This increased interest in the better type of house is not so much a result of the enormous fire waste of the country, amounting to nearly a quarter of a billion dollars a year and chargeable directly to the preponderance of inflammable building, as it is a result of experience with repair bills, maintenance and depreciation upon quick deteriorating construction.

It is characteristically American to take a chance with the fire hazard while resenting the element in building that hits the pocketbook.

Building to burn does not indicate, in the American, a disregard for the safety of his family or his own life. But until fire takes away his property, or possibly a human life that was dear to him, he does not realize what a risk he has been exposed to. The fact that a house catches fire somewhere in the United States every minute of the twenty-four hours from one year's end to another, is only of passing interest to him until it happens to be *his* house or that of a friend or relative.

Then he begins to think of a safe house. He wonders why he has been so particular about locating his office in a fireproof building; putting his car in a fire-

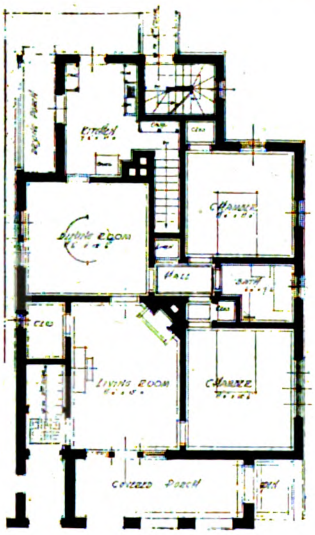


Complete working drawings, elevation and specifications for this house may be secured for $2.00 by applying to the Society Advocating Fire Elimination, Leader-News Building, Cleveland. The following bids for the erection of this house, complete, according to typical specifications, were received from reliable contractors:

Contractor "A," $4,750.00; Contractor "B," $4,943.80; Contractor "C," $4,875.00

proof garage and locking up his valuable papers in a fireproof vault while his family lives and sleeps in a building made wholly of inflammable material, absolutely without fire protection and possibly miles from the nearest piece of fire apparatus.

He often has complained about fuel bills and the inability of his heating plant to make the house comfortable when the winter winds come out of the northwest. His forehead is in scowls when he pays the frequent repair bills and the painting cost every two years. The real estate man is a failure, he thinks, because he cannot get within thirty per cent as much for the place as it originally cost only a few years ago, and he quarrels with the fire insurance man over the high rate every time he pays the premium.



With this ever-increasing cost of maintenance it comes forcibly to his mind that it is the wrong kind of a house.

He never went in for the cheapest things before and he cannot understand why he did in buying a house. It has always been a hard and fast rule of his business that "the best is the cheapest." In the material he uses in his business he never deviated from this principle. He bought his clothing by the same rule and insisted that his family do so.

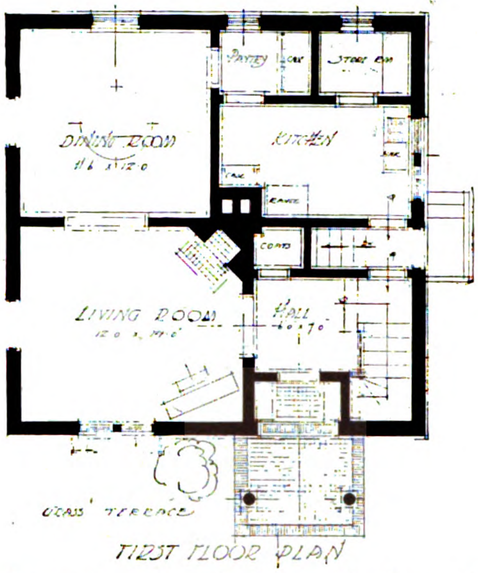
"It isn't the first cost that counts; it's quality."

Yes, he had repeated that often. How did he ever go so far away from this proven law in buying a home?

Someone had tried to sell him a brick house at the time he purchased his home. The price was a few hundred dollars higher and the other house was the same size and just as well finished inside. He could not see the difference—*then*.

It is a fact, he recalled, that the same brick house recently was resold at a higher price than he could have bought it for several years ago, while he would have to sacrifice nearly one-third on his place to get rid of it because it has depreciated.

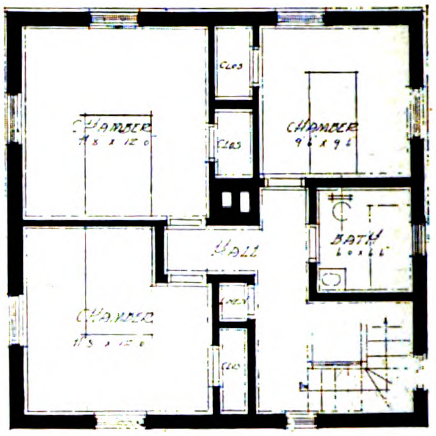
He had made a mistake.



The cheapest construction is not the best. Quality counts as in all other things. He knows it now.

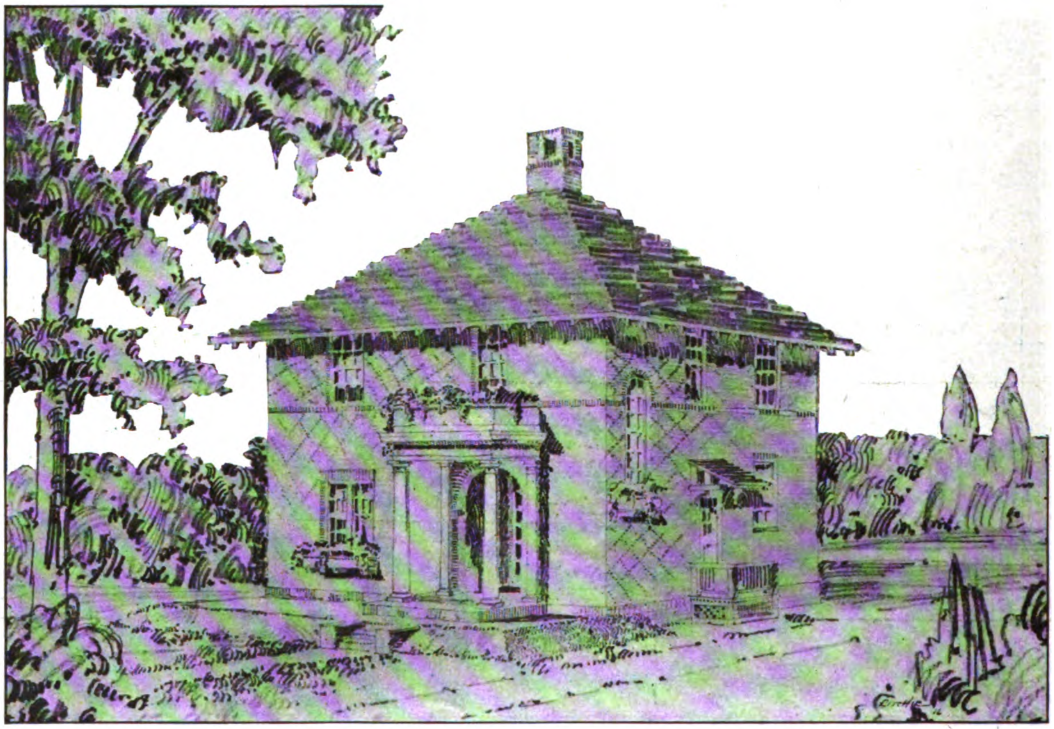
Proof of Economy

Those who are planning a home to-day have little reason to hesitate in a decision between brick and the less substantial material. Even the first cost difference has been practically eliminated and the many advantages of the house of brick stand out more prominently than ever before.



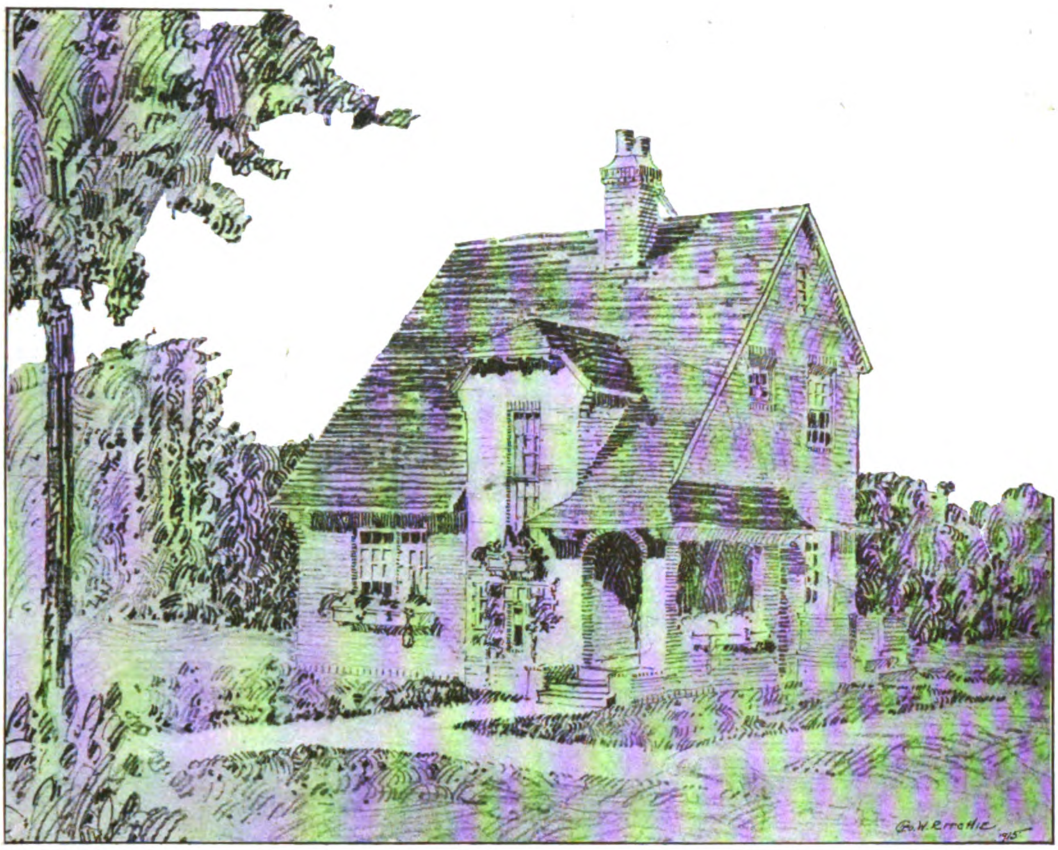
In preparing the information for this book with a view of producing positive proof that the brick house is more economical to buy, build or rent than the prevailing type of house, a survey of building operations in several cities was made.

George W. Ritchie, an architect of extended experience in the East and for several years an architect for the Board of Education of the city of Cleveland, was commissioned to produce ten low cost brick houses that might displace, at *no greater cost,* corre-



Complete working drawings, elevation and specifications for this house may be secured for $2.00 by applying to the Society Advocating Fire Elimination, Leader-News Building, Cleveland. The following bids for the erection of this house, complete, according to typical specifications, were received from reliable contractors:

Contractor "A," $4,000.00; Contractor "B," $3,860.00; Contractor "C," $3,925.00

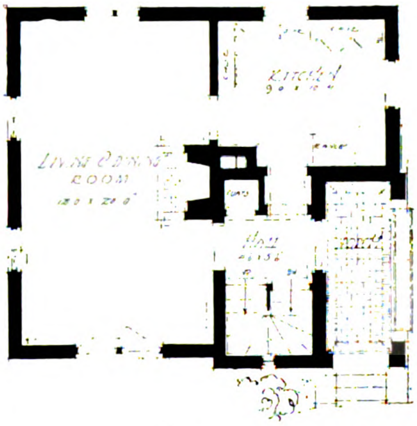


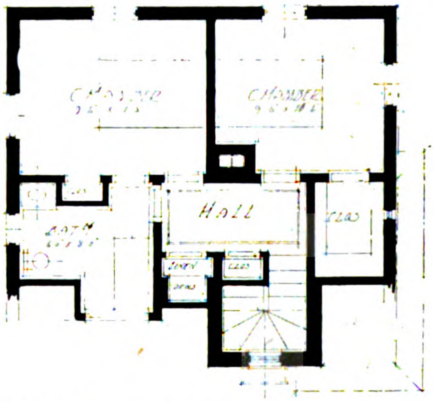
Complete working drawings, elevation and specifications for this house may be secured for $2.00 by applying to the Society Advocating Fire Elimination, Leader-News Building, Cleveland. The following bids for the erection of this house, complete, according to typical specifications, were received from reliable contractors:

Contractor "A," $3,200.00; Contractor "B," $3,300.00; Contractor "C," $3,375.00

sponding types being erected in quantities in both the large and small cities of the Middle West.

Accompanied by the compiler of this book, he visited scores of new houses in Cleveland and nearby cities. The houses were carefully inspected and measurements taken. Questions were asked as to cost of construction and rental value. The architect then began the task of substituting for these inferior houses which are unartistic, box-like buildings, ten types in brick that may be completed at the same first cost as the houses visited.

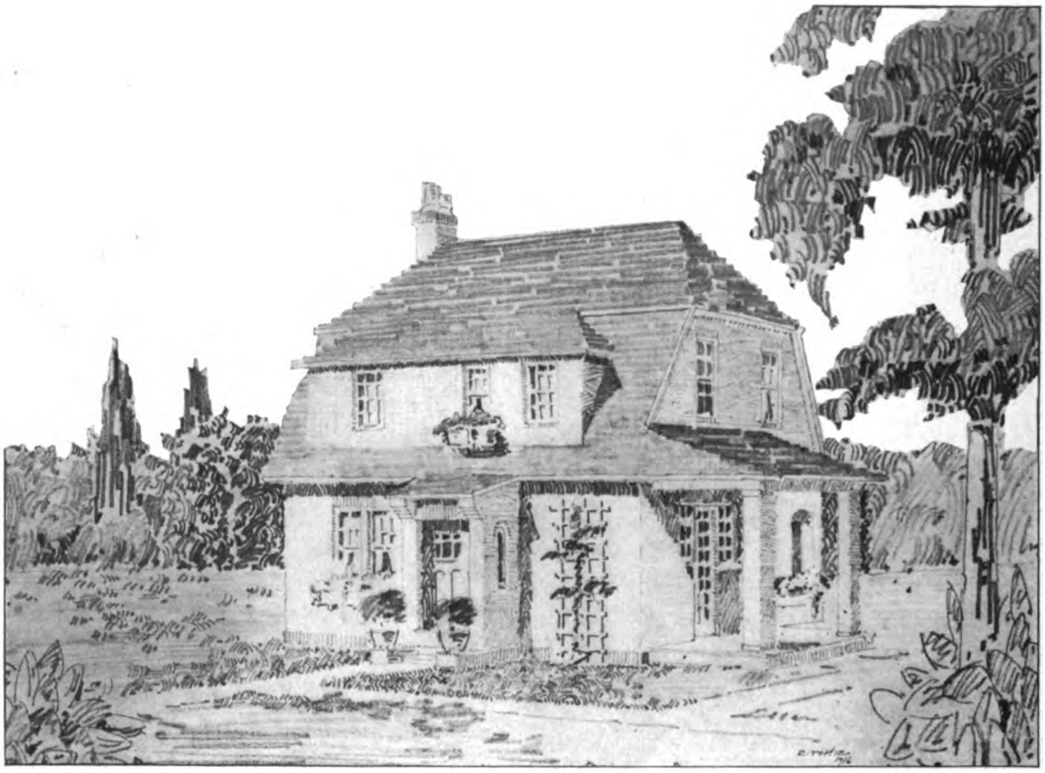




Instead of duplicating or reproducing the prevailing real estate or ready-to-occupy houses, Ritchie has improved upon every feature. The exteriors have been made artistic and distinctive in appearance. The interiors are better arranged and space is economized.

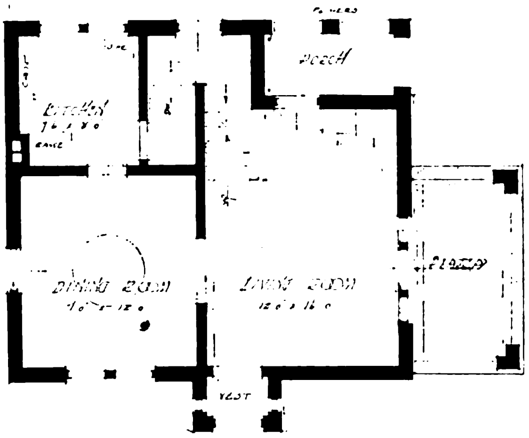
How well the architect has succeeded is shown in the cuts that follow and the actual bids for their erection made by reliable contractors.

The investigation has proven that the average man,



Complete working drawings, elevation and specifications for this house may be secured for $2.00 by applying to the Society Advocating Fire Elimination, Leader-News Building, Cleveland. The following bids for the erection of this house, complete, according to typical specifications, were received from reliable contractors:

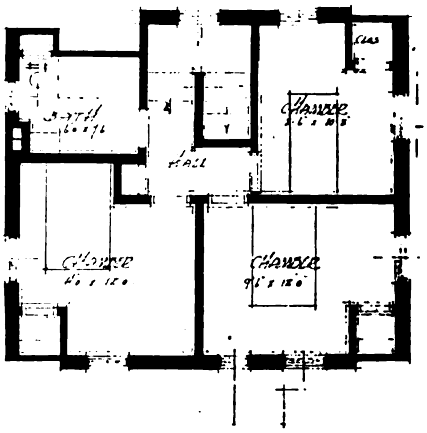
Contractor "A," $3,400.00; Contractor "B," $3,510.00; Contractor "C," $3,485.00



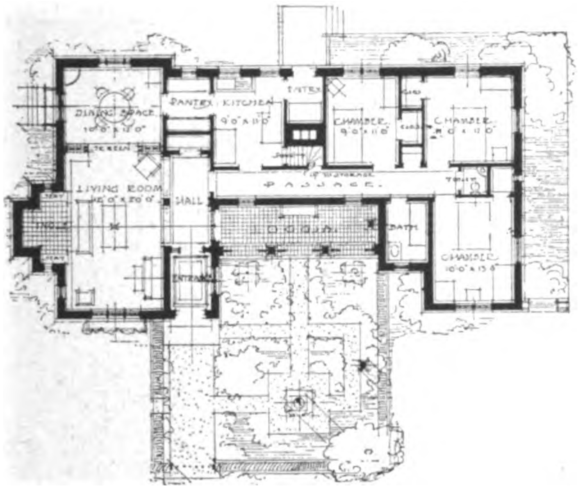
with from $2,500 to $5,000 to put into a home, may have a substantial, artistic, fire-safe house at exactly the same first cost that is being paid to speculative builders for poorly built, badly arranged firetraps.

The speculative builder works from two or three stock plans. This means that his houses are duplicated over and over again. Whole streets are built up of houses that are identical in every line. The owner knows his own home by a number on the door or by counting its number from the corner of the street. He cannot feel any great pride in his home when there are forty-nine others exactly like it within sight of his front door.

The buyers of the speculative houses are people demanding "easy" terms. To finance building upon the small down payment and monthly installment plan the builder must add an enormous profit to his construction cost. He must cut every corner in the building and use the poorest of materials. The innocent buyer gets the poorest possible construction at a



price that should have given him first-class construction. The builder is interested in the house only until his customer takes over the contract. He doesn't care what happens after that. The consequence is that the buyer faces rapid depreciation, big repair and painting bills, high fuel bills and uncomfortable winters and never is able to get his money out of the property if he wants to sell it.



The prospective builder should consider that it is not possible, always, to take a plan drawing for other kinds of construction and reproduce it with economy in brick. The house of brick should be designed for brick by an architect who knows how to use the material. It was on account of his knowledge of this work that Ritchie was selected to design the face brick exhibit at the Complete Building Show and to draw these low-cost houses.

The "jim-cracks" and bump and bumps that work out so easily in some materials but of which the owner soon grows tired, are not suited to a brick house. They do not belong to any house and never are seen on artistic homes.

The brick house never grows "old-fashioned" as do the houses of freak design. The brick house fits into its surroundings and becomes a part of it, the same to-day and forever.

Vines may be trained over its walls never to be torn down for repainting or repairs to the walls, but to grow more beautiful with the passing years. The brick house does not have to be painted. Repairs are unthought of. When it has a roof of inflammable material, as it always should have, it becomes safe against fire from the outside and is a wall in the way of a sweeping fire even though surrounded by houses of a burnable kind.

The brick permits the owner to realize upon the increased value of his land and this increase is not offset by the depreciation of the house itself. The brick house becomes, then, a good investment for the owner, and in addition to providing a safe and comfortable home, summer and winter, is his best savings bank.

◆

Gain in Safe Homes

That the owning of a safe home is not mere idle speculation, on the part of prospective home builders, is shown in the reports of the Building Department of the city of Cleveland.

For the year, to date, these figures show a gain of 22 per cent in the number of safe homes over the corresponding period last year

When it is considered that the bulk of residence building is being done in the suburbs—there being only a small amount of undeveloped residence prop-

As built in Greater New York, where both labor and building materials are at top prices, this bungalow cost $10,000. *It could be duplicated in the Central West at a cost of probably much lower than that amount.*

erty within the city limits—the force of these figures is better realized.

The Safe takes credit for this fine showing. Before its activities commenced, there was no demand for homes of better type than frame. The flimsy house was the rule, and everyone seemed content.

With the first four months as a criterion, this year will show a tremendous gain in safe homes.

To Extend Fire Limits

The activities of *The Safe* are beginning to bear fruit in Cleveland in a move to extend the fire limits to include some of the outlying districts.

One public hearing already has been held by a committee of the council to hear arguments in support and against the project.

It is proposed to establish a fire-zone along the thoroughfare, which forms the back-bone of one of the large residence wards. This follows the plan adopted many years ago in Detroit, where the radiating streets from the Campus are restricted to safe construction, to provide fire-stops in case of conflagration of surrounding frame buildings.

As usual the lumber interests were arrayed at the hearing against any move to protect the city from fire loss, and by the real estate operators, who specialize in and encourage flimsy construction.

The Safe was represented by its secretary, Ralph P. Stoddard, who was virtually the only advocate of Safe and Permanent Building at the hearing. He was enabled, however, to "put over" some "safe" arguments, which the lumbermen could not answer.

There is every prospect this ordinance will pass and that it will inaugurate a general move on the part of other wards to protect themselves similarly.

Chicago, has, within the year, added twenty square miles to its fire protected area by this plan of restricting detached areas in which business communities have developed.

No small part of the sentiment favoring the extensions in Cleveland has been roused by the wide circulation of CONSTRVCTION in the sixth city. Its driving home of the facts of the recent conflagrations in the South and East is admitted to have set many persons thinking of their own safety. And the *Safe* propaganda, which appears in some form in every Sunday paper, has done nothing to add to their satisfaction with present conditions.

The Best $3,000 House

In the architectural competition, held in connection with the Complete Building Show in Cleveland a few weeks ago, close to three hundred drawings were submitted by architects from all sections of the country. A gallery of these constituted a popular feature of the building show.

This section was crowded all day long. Many visitors communicated directly with designers of plans they particularly liked, with the object of obtaining complete plans and specifications.

All of which indicates the great interest people take in home planning.

For the benefit of those unable to attend the show, as well as those who failed to obtain names and addresses of designers of plans in which they were interested, the show company has gathered into one book fifty drawings picked from the entire collection.

These are not necessarily the best, but represent those which had the call in popularity with those attending the show. The book includes also the prize-winning designs, with interior views of first prize house, and the eight mention drawings. The remaining drawings show a wide range of types of beautiful and livable small houses. From among them prospective home builders should be able to pick a plan suited to their particular tastes and needs.

The book is well bound in a heavy art cover—in short, a permanent reference book.

The price of "Every Man's Home" has been limited to $1.00, which represents the bare cost, to the show company, of printing, handling and mailing.

Secretary Ralph P. Stoddard, of the Society Advocating Fire Elimination, carried the gospel of safe building to Akron, Ohio, where he addressed the members of the Real Estate Board of that city.

The "Rubber City" is enjoying a business boom which has outdistanced the building operations to such an extent that housing has become a problem.

While the need for increased facilities is immediate, the realty men are anxious to encourage a standard of building, which will not discredit the city in the future.

To aid in solving this problem some of the Akron members of *The Safe* urged upon the realty men the advisability of having Mr. Stoddard outline the work *The Safe* has done elsewhere, in the hope similar results may be obtained there.

WEATHER: Always warm in winter and cool in summer if you are in a firesafe home, office or factory building.

The Fireproofing News

LATEST EDITION

CONTAINING DETAILED DESCRIPTIONS OF NEW DEVICES AND APPLICATIONS OF MATERIALS WHICH ARE OF REAL VALUE IN FIRESAFE BUILDING: ALSO NOTES ON THE LATEST BOOKLETS, CATALOGS AND OTHER FIRESAFE LITERATURE, WITH OTHER ITEMS OF INTEREST TO THE FIREPROOFING FRATERNITY

Copyright by Construction Publishing Co., of New York, N. Y., 1916

New York City, N. Y., May, 1916 **Priceless**

NOW IS THE ACCEPTED TIME

SOUTHERN CONFLAGRATIONS MEAN GREAT OPPORTUNITY FOR FIRESAFE MATERIALS

It is exceedingly unlikely that a lifetime will witness another situation such as exists now throughout the Southland as a result of the conflagrations at Augusta, Ga.; Paris, Tex., and Nashville, Tenn.

Certainly no other fire or series of conflagrations presented such an opportunity for furthering the cause of the best in modern building practice.

The San Francisco disaster, costing more than $500,000,000, was confined to one city, like the Chicago, Jacksonville, Baltimore, Boston, Salem and other fires. None presented such a golden chance for the service of firesafe construction, such as is now offered; for in the present instance we have the remarkable case of three vast simultaneous conflagrations raging at widely separated places in different states, all within the Southern field, and like conditions prevailing at each—high winds and a marked predominance of combustible material.

Press Condemns Wood

As a result we note the unanimous voice of the Southern press raised in stern condemnation of burnable material, with fire chiefs, fire marshals, building department officials, insurance authorities and others to whom first-hand observation and practical experience have given the right to speak with authority, blaming in the most positive utterances the baneful wood shingle for the awful disasters and holding it aloft to national public shame for the criminal building agent it has ever been since that day when the first wood shingle roof was laid.

Public Wants Firesafe Construction

We observe the people of the great Southland attentive to the subject of fireproofing in a way never before known.

They have been burnt!

Needless now to talk of the crushing, devouring force, the awful rapidity with which fire approaches, envelops, licks and consumes human beings, homes, offices, factories, hospitals, libraries, furnishings, records—everything which represents civilization, which symbolizes our hopes and ambitions, and for which men, women and children have given time, blood, sweat and nervous force to rear and hold.

Yes, through the South the lesson *against* antiquated, flame-loving wood and *for* its modern "substitute" — firesafe materials and protective devices—has been given with peculiar force to the entire nation.

Manufacturers Prepared to Meet Demands

And despite the fearful price exacted by the awful penalty, it were far better that this remarkable series of conflagrations should arise now rather than to have occurred fifteen or even ten years ago. For now the lesson will be listened to—and heeded—more than any time. Now manufacturers produce standard materials and protective devices which have proven worthy of use and confidence. Now the cost of a firesafe home as against that of combustible material averages from five to eight and very rarely over ten per cent; and the first cost is the final cost. Figuring this final cost as the real expense, the firesafe structure is by far the cheapest—and safest; there are the items of reduced insurance rate, lowered coal expense, no painting or repairing, immeasurably superior durability, sanitation, sound-proofness and numerous other factors which in the aggregate give the firesafe building a superiority over that of wood construction which is overwhelming and beyond all logical argument. For now manufacturing, architectural, engineering and contracting science have evolved a genuine firesafe building in every type of construction. The old-time so-called "fireproof" structure is but a milestone on the road of progress which leads to present-day fireproof building, based on tests, facts and proven service.

How Hard Are You Going to "Boost"?

It is for all those industries and all those factors related to firesafe construction to utilize to the utmost the unexpected and unprecedented opportunity offered by the Southern conflagrations. By so doing they will advance the fireproofing cause more in the next twelve months—that time when reconstruction work will be in progress down South—than has been done in any year since firesafe building first made its plea for public favor.

Firesafe Building—Give it local and national publicity and advertising. Don't "knock" your competitor — "boost" your product, and co-operate with him. You've got but one real competitor—combustible construction. And the most telling way to defeat wood is to hold down personal opinions and hold up ascertained facts. You are on the right side of the building game. If you know your business you also know there isn't a man in America who can praise wood and depreciate firesafe products—and be fair-minded at the same time. Opportunity is holding a wide-open door for you. *Get in and boost firesafe materials!*

NATIONAL FIRE PROOFING CO. CONDUCTS COMPETITION FOR ONE-FAMILY HOUSE

Under the patronage of the National Fire Proofiing Company, Pittsburg, Pa., a competition will be conducted for a one-family dwelling to be built of Natco Tex-Tile at a cost not to exceed $4,000. The closing date will be June 20th at 5 p. m. There will be four prizes, the first being $500, second $250, third $150, fourth $100, and honorable mentions. This contest is open to all architects and architectural draftsmen.

The Program

The Problem: A house of not more than 20,000 cubic feet to accommodate one family.

The Lot: Situated within a block in the residential section of any city or town; 30 feet frontage, 100 feet deep, land level.

Cost of House: Not to exceed $4,000; figured at 20 cents per cubic foot.

Measurements: Must be taken from outside face of exterior walls and from level of basement floor to average height of all roofs. Porches, etc., to be figured at one-fourth (25 per cent) of their total cubage.

Exterior Design: Optional with the designer, with the suggestion that due consideration be given to the material to be used in exterior walls, and the elemental refinements which a house of this type should possess.

Plan Arrangement: The number of floors, and number, size, and disposition of rooms left entirely to the designer, except that there shall be at least two bedrooms.

Roof: Treatment optional with the designer.

Only One Drawing Required

A pen-and-ink perspective, without wash or color, shown at a scale which will, with entourage, fill approximately the upper half of the sheet. Plans at a scale of 8 feet to the inch and section showing construction of exterior walls through roof; height of floors to be given on section. A key cross section at the same scale as plans showing height from cellar floor through all roofs. Enough detail sketches to fill out sheet. The dimensions of each room must be given on the plan at a size to permit two-thirds reduction and be clearly read. In connection with plan of first floor give plot plan. Plans are to be backed-in solid, and graphic scales must accompany the plans and sections. The drawing must bear the following title: "Design for a One Family House to be Built of Natco Tex-Tile." In a space measuring 4 by 5 inches—enclosed within rules—is to be given, at a size which will permit of two-thirds reduction, a calculation of total cubage. The cubage will be carefully checked before the designs are submitted to the jury. The jury will positively not consider those designs which exceed the prescribed cubage. The size of each sheet is to be exactly 22 by 30 inches. Plain black border lines are to be drawn on the sheet 1 inch from edges of the long dimension and ½ inch from edges of the short dimension, giving space inside the border, 21 by 28 inches. The sheet is to be of white paper and is not to be mounted. Very thin paper of cardboard is prohibited. The drawing is to be signed by a *nom-de-plume* or device, and accompanying same is to be a sealed envelope with the *nom-de-plume* on the exterior and containing the true name and address of the contestant.

The jury will give consideration: First, to the excellence of the design and its fitness to the materials employed.

Second, to the excellence of plans.

This competition will be judged by five members of the architectural profession, selected from different sections of the country.

The purpose of this competition is primarily to encourage the larger use of Natco Tex-Tile and a further study of the small house problem. Competitions that have treated of similar problems have had a large influence upon the design of very many of the smaller houses that have been built in recent years. The results of each successive competition have shown large improvement, and it is hoped that this one will contribute its full share toward the improvement in plan and design of houses for people of moderate means. Natco Tex-Tile has all necessary structures and artistic advantages, with air spaces to check moisture and heat. It is economical in initial cost and maintenance. The various bonds adapted to brickwork can be used; the running bond is the simplest, while the Flemish or Dutch produce good effects in large spaces.

Drawings are to be delivered flat or rolled (packaged so as to prevent creasing or crushing) at the office of *The Brickbuilder,* 85 Water street, Boston, Mass., on or before June 20, 1916.

The Postoffice Department now requires that drawings sent by mail shall be at the letter—or first-class—postage rate.

Drawings submitted in this competition are at owners' risk from the time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The prize designs are to become the property of *The Brickbuilder,* and the right is reserved by *The Brickbuilder* to publish or exhibit any or all of the others. The full name and address of the designer will be given in connection with each design so published or exhibited. Drawings will be returned from the office of *The Brickbuilder* to the contestants.

$108,857 TO ADVERTISE WOOD

More than one hundred thousand dollars is a large sum for one small organization to spend in one year in order to feature but one kind of wood from one section of the country, yet that is the amount expended during the past twelve months by The Southern Cypress Manufacturers' Association, which is composed of a limited group of Southern lumbermen. And the instructive and inspiring feature is that they express pleasure in having spent this neat fortune, because they regard it as an investment which has brought returns instead of a burdensome expense on their industry.

Another group of up-to-the-minute lumbermen, larger in numbers and quantity of production than the manufacturers of cypress—The Southern Pine Association, a successor to the old Yellow Pine Manufacturers' Association—has an agreement by which each member pays an assessment of 25 per cent for every thousand feet of lumber sold. Basing the estimate on last year's cut, this assessment will yield a fund of $300,000—and it is planned to add more as the lumber sales increase by reason of the advertising and publicity.

As wood is no longer too cheap for firesafe materials to progress in the home building field, it seems proper to ask the Southern manufacturers of firesafe products what they are doing, individually or collectively, to counteract the influence which these two lumber associations are sure to exert through their commendable activities in favor of pine and cypress.

NEW ROOFING TILE BOOK

Architects and Engineers Offered Complete Detailed Reference Volume

Probably the best work ever put out by any company manufacturing roofing tile has just been offered the architectural and engineering professions by the Ludowici-Celadon Company. The volume, the dimensions of which are 9¾ by 13½ inches, has a very heavy stiff cover, which is a good precaution because the pages, of which there are 212 printed on one side, are held in place by strong brass staples, allowing the addition of new material and the deletion of superseded data.

As explained in the introduction, the work is a detailed reference for architects and engineers, and how thorough an effort has been made to make the book of the utmost value to those who have to create, plan and construct roofs is evidenced in the very complete index, which covers practically every question likely to arise in roof construction. Over one hundred pages of bold black line drawings are presented, showing sketches, plans, sections, various views of separate pieces, different methods of construction and other details of tile and metal treatments, necessarily limited to those covering methods of construction usually found in the work of the Ludowici-Celadon Company, are shown. While an attempt has been made to have the proper trimmings, etc., in sequence following the tile pattern, some departure has been necessary, in which case the index will serve its purpose.

The Ludowici-Celadon people are to be congratulated on so worthy a work. The expense and labor manifested in the book and the evidence which it reveals of genuine service to architects and engineers will assure it a prominent place in reference libraries. Those in the professions facing roofing problems should communicate with this leading firm of terra cotta roofing tile manufacturers, regarding the volume, addressing their requests to the general office at 104 South Michigan avenue, Chicago, Ill.

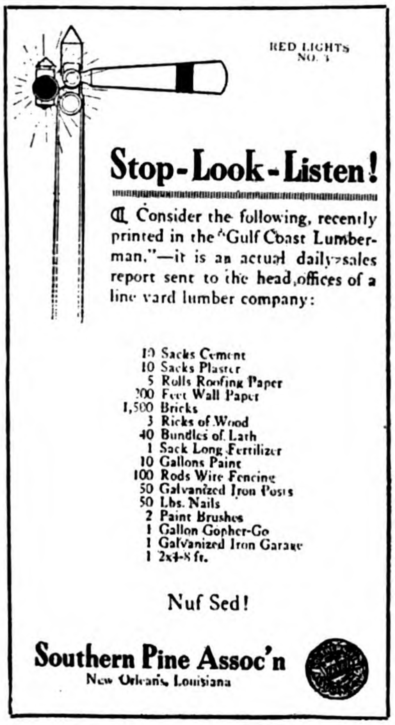
'DANGER SIGNALS' WARN LUMBERMEN TO BOOST WOOD

The most progressive of the lumber advertising organizations, The Southern Pine Association, is issuing a series of "red light" danger signals to arouse lumber yard dealers and others related to the lumber industry to the pressing need for boosting wood.

Reproduced below is one of these signals, known as "red light Number 3," which is interesting for two reasons; first, it shows one line of activity pursued by the lumber boosting organizations; second, it illustrates the fact that firesafe materials constitute items to be reckoned with by the lumber yard trade.

This is evidently the record of one day's sales of a retail lumber yard. In a measure it is, of course, an unusual day's business for only one small order for lumber was taken, while a considerable number of other items, not lumber, were sold, including cement and brick. Very likely because of its unusual nature, the lumber association seized upon it as splendid material to feature before the wood industry as a "warning" example of the way other building material is encroaching upon the sales of lumber in the retail yards.

LUMBER WORLD REVIEW



RED LIGHTS NO. 3

Stop - Look - Listen!

¶ Consider the following, recently printed in the "Gulf Coast Lumberman,"—it is an actual daily sales report sent to the head offices of a line yard lumber company:

10	Sacks Cement
10	Sacks Plaster
5	Rolls Roofing Paper
200	Feet Wall Paper
1,500	Bricks
3	Ricks of Wood
40	Bundles of Lath
1	Sack Long Fertilizer
10	Gallons Paint
100	Rods Wire Fencing
50	Galvanized Iron Posts
50	Lbs. Nails
2	Paint Brushes
1	Gallon Gopher-Go
1	Galvanized Iron Garage
1	2x4-8 ft.

Nuf Sed!

Southern Pine Assoc'n
New Orleans, Louisiana

Real Meaning of the Signal

Constrvction sees in this instance not a red danger signal but that light which indicates a clear and safe road for the lumber yard dealers to travel; for it is the road being built of firesafe material by the hand of progress—and it leads to that time when popular demand will require in an ever-increasing degree the materials which are necessary for modern building practice. And the best in modern building means firesafe construction,

(*Last column, next page*)

Want Trade Catalogs

E. B. Croft and F. C. Boerner have opened offices as architects and engineers at 801 Place Building, Minneapolis. They will specialize in reinforced concrete industrial buildings. Both Mr. Boerner and Mr. Croft are graduate civil engineers from the University of Minnesota. They have just returned from the East where their work has been with the Turner Construction Company of New York City. Croft & Boerner wish copies of all trade catalogs pertaining to their work.

The Fireproofing News

MAKING ONE COPY OF A MAGAZINE SERVE ALL DEPARTMENTS

In a recent number of *Factory* is suggested a simple and most effective method of sending periodicals through every department of a business organization. A form, known as a "circulation slip," is pasted on the outside front cover of the magazine to be routed. The first column offers space for the names of department heads to whom the copy is to be passed. The next column is for a check mark, followed by two more columns headed "See Articles on Pages" and "See Advts. on Pages." The last column is for remarks. One person, responsible for such work, reads through the publication and fills out the "circulation slip," after which it is passed through the organization.

This is a business-like way in which to get maximum service out of magazines. Many of the progressive business houses follow the idea, but there are hundreds of concerns which are not in any measure alive to the benefits of keeping their associates posted on all that relates to their industry. As a general practice one man receives a publication and after he is finished with its contents, it is put on the top of his desk, buried in a drawer, or finds its place on the table in the general reception room.

This habit is both thoughtless and unwise. The publishing business, as now conducted, represents highly specialized service. No magazine can succeed on any other basis—its worth is determined by the value of that service which it renders. The editorials and other articles mean careful study by experienced men who present the practical fruits of their efforts that all who read may be the better informed regarding that knowledge, the practice of which makes for improved conditions in the various professions and industries.

An Example of Maximum Service

Here is a concrete illustration: the April number of CONSTRVCTION featured the stories of the great Southern conflagrations. Not only should that number be read by all the executives of any company interested in modern building practice, but it should be gotten before every salesman and agent throughout the country. In their hands it constitutes a genuine help in hammering home the argument for firesafe construction. In a measure the salesman's best efforts are discounted, as the prospect knows he is dominated by but one thought—to dispose of his line. But a copy of CONSTRVCTION means evidence from a disinterested source which can hardly help but strengthen the agent's plea for fire prevention. In the average city throughout North America no fair-minded prospect can deride the thought of his home or city burning in the face of such authenticated history as is presented each month in CONSTRVCTION. Thanks to dumb luck and blind good fortune this country does not often have twenty-four hours in which three great simultaneous conflagrations rage in different States in one section of America, wiping out thousands of homes and business structures and teaching a lesson which no prospective purchaser of firesafe materials or equipment dare ignore. For which reason the April number of CONSTRVCTION ought to be on the desk, atop the table, and in the grip of every progressive firesafe material man.

◆

To accommodate an increasing business and to secure more convenient access with architects and engineers, the Pennsylvania Wire Glass Company has moved into its new quarters in the Astor Court Building, 20 West Thirty-fourth street, New York.

◆

Plans for a permanent building exposition which will be opened May 1st have been completed by the Builders and Traders Exchange of Detroit, Michigan.

◆

The Builders and Traders Exchange of Grand Rapids, Michigan, held their second annual banquet in that city on May 3d at the Livingston Hotel. Secretary A. H. Shank, in planning for a large attendance, proved himself a real prophet. The entertainment committee was composed of Messrs. Hoertz, Jr., Vander Waals, Ziesse, Beyne and Morgan.

equipment and furnishings.

More and more laws, codes and other enactments are doing away with the use of wood in building construction. Fire history and statistics—and ordinary common sense—demand that we cease burning several thousand human beings and more than $250,000,000 worth of property every year.

Lumber Yard Men on Right Track

The lumber yard men see the diminishing sale of combustible material. The very fact that they carry firesafe products is simply a move to supply a growing demand—else they would not handle such items. In meeting this demand they are doing the business-like thing, for they must either supply what the people want—or stand by and watch the sales and profits go to someone else.

The day is fast approaching when the lumber yard will be known as a "builders' supply yard." Indeed, in a vast number of instances, the old name is now a misnomer. Already it is not at all unusual to walk into a lumber yard and leave your order for firesafe materials.

Where Firesafe Men Should Co-operate

But one other point: there is evidence that lumber yard men are adapting themselves to new conditions. They are established, they know the local building conditions and, of course, are known as sources of supply for building materials of both kinds. Why should they not be co-operated with as logical channels for the handling of non-burnable products? Popular demand is pointing the course for them to follow—and they are following it, as the "red danger signals" show. This clearly indicates a big opportunity for the firesafe material manufacturers to become more active in advertising and publicity than they have ever been before. National effort of this sort is certain to increase interest in firesafe construction—and hasten the day when lumber will be a side line in the "builders' supply yards" of America.

◆

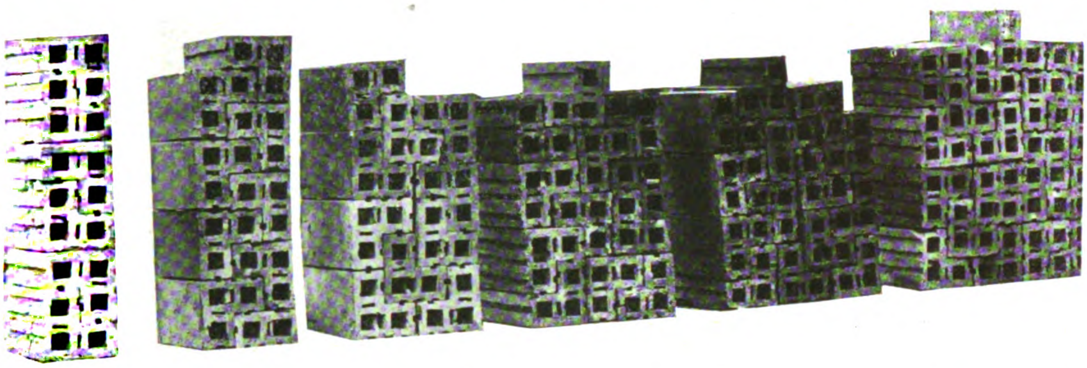
The Coroner's Office for the Borough of Manhattan recorded 119 deaths between 1907 and 1915, due to elevator accidents.

The Fireproofing News

NEW INTERLOCKING TILE ENJOYS GROWING MARKET

CANADIAN PRODUCT WELL ADAPTED TO SMALL FACTORY CONSTRUCTION

"Sampson Interlocking Tile," invented and patented by W. W. Smith, of Shallow Lake, Ontario, Canada, during 1914, and introduced last year to the building trade in the United States, is making good progress, especially in the field of structures of four stories and under. The Constable Building, at Toronto, and the Haeger Brick and Tile Pottery Plant, at Dundee, Ill., are constructed of this material.



This tile is so designed that walls of almost any desired thickness may be built. There are no continuous mortar joints, either horizontally or vertically, thus assuring freedom from dampness. Maximum heat and cold insulation are provided by the double mortar beds, separated by closed air cells, and as these air chambers are horizontal, internal air circulation, caused by up-and-down drafts, is avoided. These features assure a comfortable building in all seasons, with that degree of sanitation and other excellences which are characteristic of the firesafe structure, such as reduced insurance rates, absence of frame boarding, furring or other burnable material. With hollow tile construction the plastering can be applied directly to the inside walls.

Construction

The construction of "Sampson Interlocking Tile" walls is simple and efficient, as practically any thickness may be built without the use of shapes other than window and door blocks. Where eight-inch walls are built from the ground a few starting tile are required. There are sufficient load-bearing webs to allow for most types of construction. This tile may be had to show either of two faces, scored or smooth, or they may be made with one rough texture face. As these face dimensions are usually 5½ by 12 inches they are well adapted to resident construction, the articulation of the surface comparing with roman brick.

The Canadian product is also adapted to small factory work, being of sufficient strength to carry the required load for such buildings. Walls may be commenced in any thickness and offset at desired intervals. The vertical webs being short and braced by frequent horizontal webs give the "Sampson" tile the strength necessary for this construction. They may be used for backing up brick veneer walls, and the many other walls possible with this material make it a worthy candidate for firesafe construction work.

* * *

The Trus-Con Laboratories of Detroit, Michigan, issue two booklets which reflect considerable planning and much care that they may be of real service to all who face waterproofing problems. "Architects Hand Book of Specifications for Waterproofing, Dampproofing and Technical Paint Products" and "Structural Waterproofing" constitute a veritable library of serviceable information upon the topics of which they treat.

* * *

He lit a match
 To read the meter;
He's pleading now
 With old St. Peter.

LUMBER LOGIC

Under the editorial caption "Why Not Use Wood Where It Is the Logical Material?" a paper devoted wholly to burnable building material prints a letter from a correspondent stating that N. C. Hutchins, the Massachusetts fire warden, "has ordered ten steel observation towers opened at once to watch for forest fires. A week later the remaining eighteen forest fire watch towers will be opened. This will put 200,000 acres of land under constant surveillance during that time of the day when forest fires are likely to start.

Below is the editorial comment on the correspondent's letter. It is a sample of that common lumber logic which would have the public believe that flame-loving wood is "just as good" as any of the standard firesafe building materials:

"The writer who contributed this interesting information is a forester, but it seems not to have occurred to him—as it evidently has not occurred to the Massachusetts fire warden—that these observation towers might be built out of wood, just for consistency's sake. There is no more reason why an observation tower in the forest should be built of steel construction than there is why sawmills should be built out of steel or reinforced concrete.

"Perhaps the campaign against unwarranted substitution of inferior materials has not reached the foresters yet. Certainly there remains a considerable number of lumbermen on whom it has made but faint impression."

Build these highly useful observation towers of wood, build the sawmills of wood. What of it if they do burn to the ground in almost every instance, due to the fact of their being in the midst of burnable material? Have not states and owners the consoling joy of knowing that even though their towers and

(*Continued bottom next column*)

DAYTON BRICK EXHIBIT A SUCCESS

In the Industrial Exhibit, recently held in the city made famous by the cash register was included an attractive exhibit by the Crume Brick Company, composed of burned clay, rough-textured face-brick and sand-lime brick, the latter being the product of the Crume Brick Company, while the Hydraulic-Press Brick Company featured face-brick.

The exhibit, which lasted eight days, was held in the new Delco Building, one of Dayton's new skyscrapers in which a large amount of sand-lime and face-brick was used.

Nearly 100,000 persons saw the brick exhibit.

Outlook for Sand-Lime Brick

During 1915 $1,135,104 worth of sand-lime brick was manufactured in this country. This, according to the Geological Survey, is an increase over 1914 of 7,140,000 brick, or four per cent in quantity, and seven per cent, or $76,592, in value. Michigan sold more than one-fourth of the sand-lime brick used in America. Minnesota was second and New York third. The sand-lime brick industry has gone the hard road of a new product, but is now firmly established. Many manufacturers propose to increase their capacity in anticipation of 1916 business. The Crume Brick Company is sold up to capacity. The plant has been in operation all through the winter but has not been able to accumulate a stock, as the brick is shipped as fast as it is made. To take care of the increasing orders, the company plans to enlarge manufacturing facilities so as to turn out fifteen million brick a year instead of six million, the present capacity.

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sawmills are but ash heaps, still, in building them of the material which is "logical" because it is in the neighborhood, they builded "consistently"? An adjacent supply of lumber constitutes no proper reason why you should "build to burn" any more than your unavoidable residence in an immoral neighborhood should lower your standard of constructive living and good character.

MINNESOTA CONTEST FOR LOW-COST BRICK AND HOLLOW-TILE HOUSES

The Minnesota State Art Commission is to conduct an architectural contest for a low-cost dwelling of brick or hollow-tile not to exceed $2,500. The competition will begin at once and close on May 27. Entries have already been closed, and only architects who are residents of the state were eligible. The cash prizes total $650.

This movement is of vital importance to manufacturers of brick and hollow-tile throughout the country as well as in the state of Minnesota, as it becomes increasingly evident that the home-builders' interest in firesafety from a structural and protective standpoint is rapidly assuming that state and national scope which must be felt in the demands made upon architects and firesafe material manufacturers.

This highly commendable movement to provide the people with plans for a brick or hollow-tile dwelling at reasonable cost is attributable to the success of other competitions for a model farm house and a model village house, both of which were designed in combustible materials. First prize will be $200; second, $175; third, $125; next three will receive $50 each. There will be six honorable mentions.

Firesafe Home Plans

It is fitting to mention here that no magazine in America features anything like the number of firesafe homes, the plans, specifications and descriptions of which appear each month in the "Safe Homes" department of CONSTRVCTION. This department, created to give national publicity to the firesafe home idea, covers all phases of the subect as they relate to fireproofing and presents full data for dwellings of every kind of standard firesafe material. Its unique and original service is being more and more appreciated by architects and owners, and the department welcomes inquiries, technical or general, regarding any angle of firesafe home construction.

* * *

Sticking your head in the sand won't keep your feathers from burning.

Better and Safer School Buildings

In America we burn twelve schoolhouses and two colleges every week. In the United States a fire occurs every day in some school. The loss of life is great, while the loss of property amounts to several hundred thousand dollars. The American people have given less thought to the protection of schools and their precious contents than has been given to manufacturing plants and buildings in general. Frequently the lives of our children are saved simply because the fire occurs while the school is not in session. Let us inform ourselves and the people and we will get the results desired —*better and safer school buildings.* From report of James R. Young, Insurance Commissioner, Raleigh, N. C.

* * *

The Mastic Wall Board & Roofing Company, Cincinnati, Ohio, are the manufacturers of Bishopric Stucco or Plaster Board, and their booklet, "Built on the Wisdom of the Ages," amply illustrated, is designed to show the application of this material to home building.

* * *

Architectural Cement Products

The catalog of the Architectural Mold Company, Detroit, Michigan, brings to one's mind the ever-widening uses to which cement adapts itself. In addition to the molds which are used for a variety of articles too numerous to mention, there is a large number of half-tone illustrations showing the products.

All the products of the molds made by this company are highly artistic for the reason that they represent in most instances the ancient Greek models, reproductions and adaptations from the Doric, Ionic and Corinthian periods. Their line is especially complete, molds being carried in stock for balls, balusters, balustrades, bands, bases, caps, capitals, flower boxes, lawn benches, lawn vases, lighting standards, monolithic shafts, neckings, pedestals, piers, posts, sectional columns, sundial pedestals, etc., etc.

MODERN IDEAS IN HOTEL CONSTRUCTION

The day of "Ye Tavern" is rapidly passing not only in city but in town and country as well. In its stead are coming the palatial hotels—"Strictly modern and fireproof."

Few travelers regret the change, for whatever the modern hotel may lack in picturesqueness it makes up in service and practical comfort. A people accustomed to every convenience and even luxury in their homes naturally look for the same treatment when they travel. The hotel man, like any other American business man, is quick to give the public whatever it wants and is willing to pay for.

"Mine host" of former days might have been successful by reason of his personal hospitality, but the success of a hotel proprietor in 1916 depends strictly upon his business methods.

Before the metropolitan hotel is built, the owner, his architect and other counselors can know the cost, the probable amount of patronage, the cost of necessary equipment down to the last towel and the average running expenses so that the profits of operation can be estimated with a reasonable degree of certainty. For what investor would part with the money necessary to build such a structure without the same showing he would demand from any other business enterprise?

It is this aspect of the hotel business that has brought the builders to such minute examination of every item that enters into hotel construction.

Safety, low operation and maintenance costs, and comfort of guests are all to be considered along with the amount of initial investment.

It is safe to say that no modern-minded hotel builder would think of using anything save fireproof construction. Even if the laws permitted it the patronage of such a hotel would not pay the running expenses. — *The Interlocker.*

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"One hundred and six persons were included in the death toll of fire during 1915 in Manhattan alone. Every one of them was a martyr to lack of preparedness for fire," says former Chief Guerin of the Bureau of Fire Prevention.

"Manhattan," he continued, "has a population of approximately two million, and the United States a population of about one hundred million. If the figures for Manhattan fatalities are typical of the country, it means that five thousand persons died of fire in 1915 in the United States. In nine cases out of ten the fatalities were inexcusable. Nine out of ten of these lives might have been saved if people would only take reasonable precautions to guard against fire. I will wager that not one home in fifty in this city has any practical means of extinguishing fire, not even a bucket of water, and even if they have a bucket the chances are it could not be found if needed. The same is true, though in a lesser degree, in stores and other business places."

THE TALLEST CONCRETE WATER TANK

Middleboro, Mass., has what is probably the largest reinforced concrete water tank in the world. Concrete was chosen for this tank and water tower because it could be finished in an artistic and attractive way, very pleasing from an architectural viewpoint.

Twelve 4 by 24-inch pilasters break up the surface of the tower and at the junction of the tower and tank, which is 108 feet above the ground, there is a balcony of reinforced concrete with bracket supports.

The tank is of the same inside dimensions as the tower, which is 41 feet, and will have a depth of water which will be 59 feet when full. The bottom of the tank is hemispherical. This is the first time that this type of construction has been used for concrete tanks.

Because of the reduction in time and expense that attended their use and for the reason that they form a dense, smooth surface requiring very little finishing, Blau steel forms were used for the outside of both the tank and tower. These forms were made as two rings, each 4 feet in width.

A complete description of the construction of this tank is given in Bulletin 68, issued by the Blau Steel Construction Company, Farmers Bank Building, Pittsburg, Pa.

◆

The Jefferson Glass Company has sent to CONSTRVCTION a complete set of their catalogs illustrating both with black-and-white and full-colored plates, their extensive line of lighting supplies for home, office and factory buildings.

◆

"The Brick Church and Parish House"

This is the title of one of the most complete and elaborate educational advertising brochures we have received, and it reflects great credit upon those in the Hydraulic-Press Brick Company who had the business initiative to produce such a piece of literature as at once gains the thoughful attention of those into whose hands it may go. This work is easily the best attempt ever made by any factor in the brick business, to bring before architects, engineers, and others interested in building construction, the possibilities of brick as adapted to religious structures.

The brochure measures 11 by 13½ inches, contains 80 pages, exceedingly well illustrated with beautiful line drawings and halftone plates, and is brought out on heavy cream paper with clear type widely spaced and easy to read. All of the prize-winning drawings, as well as those which received honorable mention in the competition for a small brick church and parish house featured some months ago by the "Brickbuilder" of Boston, are gathered together in this notable work.

The Hydraulic-Press Brick Company is to be commended upon its willingness to expend the thought, time and money required for the production of this brochure, the best obtainable literature of its kind showing the application of brick to ecclesiastical work.

◆

"Producing an absolutely waterproof hollow cement building block with a sparkling granite veneer facing at a reduced cost of manufacture, made possible by casting blocks from patented multiple molds, constitutes The Zag-

INTERNATIONAL PUMP COMPANY PROPERTY GOES TO SUCCESSOR

The properties of the International Steam Pump Company were turned over recently to that company's successor, the Worthington Pump and Machinery Corporation, recently organized under the laws of Virginia, the plan of the joint organization committee having become effective.

Certificates of deposit of securities in the old company may be exchanged from now on for securities of the new.

The new company starts business with $3,093,000 cash. It has acquired direct ownership of the properties owned by the International Steam Pump Company and its subsidiaries, with the exception of the Henry R. Worthington works. In that it owns practically all of the common and more than ninety-five per cent of the preferred stock. Its only outstanding liens are $200,000 five per cent bonds of the Jeanesville Iron Works and $423,400 five per cent bonds of the Holly Manufacturing Company.

A voting trust, to continue five years from last April 1, has control of all of the new company's stock. The trustees are Lewis L. Clarke, George G. Henry, Percy Jackson, R. Walter Leigh and Charles H. Sabin.

McCullough Joins Portland Cement Association

Ernest McCullough, for many years a well-known consulting engineer who has specialized largely on reinforced concrete design and construction, has recently become identified with the Portland Cement Association, 111 West Washington street, Chicago. Mr. McCullough will be known officially in his new connection as chief engineer, Fireproof Construction Bureau.

Mr. McCullough is a member of the American Society of Civil Engineers, the Chicago Engineers' Club and the Western Society of Engineers, having served the last as second vice-president in 1914, first vice-president in 1915, trustee in 1911, 1912 and 1913, and at present as trustee of the society for a three-years' term ending 1918.

FOUR YEARS OF ACHIEVEMENT

This month the Chamber of Commerce of the United States celebrates the fourth anniversary of its foundation. The officers and members of it can look back upon achievements which certainly have no parallel in this country and which bear conclusive testimony to the mature growth of a new force in our economic life. They have believed that democracy is not a synonym for inefficiency and have proved that co-operation and a united sense of service to the community lead to efficiency of a high and stimulating character.

At the time the Chamber of Commerce of the United States was organized—April 23, 1912—few could be confident of the future interest it would attract, or foresee the vast scope of its present eminently practical service.

Remarkable Growth

The Chamber, within the brief period of four years, has grown to include over 700 commercial organizations and 3,300 individual members—with the limit not yet in sight.

The propaganda of the Chamber divides itself clearly between the constructive work for the advancement of American commerce, carried on through committees, on the one side, and service to American business organizations, firms and individuals, carried on through the Washington headquarters, on the other. It cannot be too often reiterated that the decision of all questions lies with the organization membership, not with the Board of Directors, which exercises powers that are supervisory and selective—supervisory over the administration of the Chamber and generally selective as to subjects to be considered and committees to be appointed.

Present Outlook and Service

This year, a critical one for American commerce in view of the world war and the position of the United States as the greatest neutral nation endeavoring to uphold the standards of civilization, the rights of neutrals, and the ideals of peace, has been one of development and adventure for American business and to an equal degree for its National Chamber. It has been the part of the Chamber to exercise foresight, judgment and enterprise to keep American business fully informed of commercial conditions, to plan against the exigencies of the future, to encourage sound and legitimate adventure into foreign fields, and to secure the counsel of the business men as represented in commercial organizations upon the leading commercial questions before Congress and the Executive.

Commended by Wilson and Taft

But the great work of the Chamber of Commerce of the United States has been its successful effort to focus business opinion. Two presidents of the United States have borne testimony to the national value of this phase of its work. At the first annual meeting, Persident Taft said:

"I speak of the movement for the purpose of showing the power that this national organization has by the referendum to all these organizations to gather from them the best public opinion that there is, in order to influence the legislation of the country, so far as that may be properly influenced."

President Wilson said at the annual meeting in 1915:

"It is very instructive and useful for the Government of the United States to have such means as you are ready to supply for getting a sort of consensus of opinion which proceeds from no particular quarter and originates with no particular interest. Information is the very foundation of all right action in legislation."

The Chamber issues a General Bulletin every week in the year.

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elmeyer System." This sentence adequately sets forth the purpose of the attractive booklet of the Zagelmeyer Cast Stone Block Machinery Company, of Bay City, Michigan. The printed matter shows why the Zagelmeyer block is waterproof, it explains the Zagelmeyer system of doing business; how the blocks are made, their wide adaptability, their appearance, the various molds and facing machines, and letters of indorsement—all are fully illustrated with clear photographs.

Your Home is Known by the Company it Keeps

The selection of a site is all important.

When you buy, rent or sell real estate of any kind our services will help.

Our three offices offer unusual facilities to every client.

GENERAL REAL ESTATE

THE
ONELLY
CO.

Main Office:

Ground Floor, Williamson Building
CLEVELAND, OHIO

BRANCHES:

East Cleveland, 13592 Euclid Avenue
Lakewood, Corner Belle & Detroit Ave.

REYNOLDS FIRE SAFE SHINGLES

APPROVED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS
TRADE MARK
H.M.R.
ESTABLISHED 1868

TESTED by the Underwriters laboratories under their standard tests, Reynolds Shingles have proven themselves worthy of classification as fire preventatives.

Reynolds Shingles have a top surfacing of granulated slate, granite, etc., and they positively will not ignite from flying sparks or brands. Where fire originates inside the building they have a marked blanketing influence.

We call them "Safety First" because they protect from rain or storms, from heat or cold and from the common agencies which spread fire.

Reynolds Shingles are the standard asphalt Shingles and you will make no mistake in insisting on Reynolds Shingles.

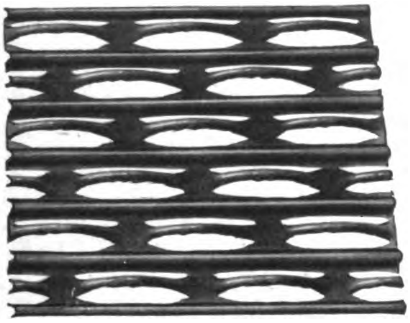
ROOFING MATERIAL
CLASS E
ISSUE No. 17

If your dealer cannot supply you write the factory.

H. M. Reynolds Asphalt Shingle Co.
"Originators of the Asphalt Shingle"
Grand Rapids MICHIGAN

"BOSTWICK"

made the first metal lath a quarter of a century ago.



"BOSTWICK TRUSS-LOOP"

has been developed from practical experience—actual service.

IT INSURES YOU
FIRE RESISTANCE
STRENGTH and RIGIDITY

A Perfect Plaster Key
Low Finished Cost

THE BOSTWICK STEEL LATH CO.
NILES, OHIO

One-half of a Brick is Service

You not only need brick for your Building Operation but you must have them when you want them.
We have anticipated the demands of a growing city.
Every year we increase our output and our service equipment.
We are now prepared for 1916 BUSINESS.

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Leader-News Bldg., Cleveland

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Service the best.

Cuyahoga Builders' Supply Company

SCHOFIELD BUILDING
CLEVELAND, OHIO

for

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CONSTRVCTION is the only publication wholly devoted to consistent fireproofing—it is actively fighting for its constituents—it wants to be measured by the value of the good it accomplishes for your product.

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Help Us to Help You

Fireproofing Information Bureau

¶ In establishing this complete reference service, manufacturers and others producing catalogs, house organs, price lists, etc., are requested to forward their printed matter and samples and place CONSTRVCTION on their permanent mailing lists.

¶ The FIREPROOFING INFORMATION BUREAU is intended for the use of resident and visiting architects, engineers, contractors and the general business and professional firesafe building fraternity, as well as prospective building owners, to whom its use will be extended gratuitously.

¶ Every effort will be made to develop and maintain this Bureau to a high point of efficiency.

¶ Prompt coöperation is solicited.

"CONSTRVCTION" TIMES BUILDING New York City

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HOLLOW TILE

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HOUSES

FLOOR ARCHES
AND
ROOF BLOCKS

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AND
WALL BLOCKS

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OF NEW YORK
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DELIVERED RIGHT
Cleveland, Ohio

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Alpha Portland Cement, Bulk Lime, Hydrate Lime, Plaster, Sewer Pipe, Flue Lining, Const. Tile, Drain Tile, Brick, Fire Brick, Fire Clay, Crushed Stone, Sand, Slag, Mortar Colors, Waterproofing, Floor Tile, Angle Iron, Dampers, Ash Dumps.
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Need Not Be Expensive

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Caen Stone Cement

In appearance it cannot be distinguished from the genuine Caen Stone of France. It has the same restful buff tone and the same feeling.
Yet Excelsior Caen Stone can be applied to any interior surface as readily as plaster and at a cost only slightly greater.

Catalog in Sweet's Ask for sample panels
The Cleveland Builders' Supply Co.
Cleveland, Ohio

Truth and Trade

By Bishop Warren A. Candler, Chancellor of Emory University, Atlanta

WHEN a seller and a buyer have made a trade, based on truth, both have obtained a benefit, and the community to which they belong has been benefited insofar as their interests affect the welfare of the community. Each has parted with that which the other needed, and in turn has obtained from his fellow-man what he himself needed. Honest exchanges, therefore, enhance values.

But trades based on untruth damage all concerned. They approach dangerously near to theft.

By advertising, buyers and sellers are brought together, and truthful advertising promotes the welfare of the commercial world; it is, in fact, a part of the wealth-producing forces of the world. But untruthful advertising is a fraud and the fosterer of fraud. It partakes of the nature of the crime of getting money, or goods, under false pretenses. The medium of advertising, whatever its nature, which lends its columns to such advertising, accepts a bribe to become accessory to the same crime.

It is a far-reaching reform proposed by the Associated Advertising Clubs of the World in the motto "Truth". Such a sentiment must act like a health-laden current on the trade winds. Its influence will extend far beyond the limits of advertising, and stimulate honesty in all the processes and transactions of commerce.

The patron saints of the commercial world ought not to be Ananias and Sapphira. Lying spirits cannot guide safely the merchantmen of the world. The argosies of trade must sail by the pole-star of truth. Otherwise they will be wrecked.

This is one of a series to Advertise Advertising, by the Associated Advertising Clubs of the World (headquarters, Indianapolis). Write for interesting booklet, written for buyers like yourself.

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ORGANIZED 1853

THE HOME INSURANCE COMPANY NEW YORK
HOME

ELBRIDGE G. SNOW, President

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3. Complete facilities for the Prompt Adjustment of Losses.

The advice which may be had gratis from the Department of Improved Risks, located at the Head Office, will be found especially valuable to large insurers.

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Automobiles, Commissions, Hail, Marine (Inland and Ocean), Parcel Post, Profits, Registered Mail, Rents, Sprinkler Leakage, Tourists' Baggage, Use and Occupancy, Windstorm.

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Not Made to Meet a Price, but to Set a Standard of Service

VIRTUE—in windows as in womankind—is not alone a physical feature but an attribute of character. A window may look well—but will it wear well? A window may appear well, on occasion—but will it conduct itself decorously on all occasions, under all conditions? Superficially, a window may attract by some physical charm all its own—but is it an honest window, through and through? Virtue—in a window—is that combination of good qualities which makes it a livable (we were about to say, a lovable) companion—not for an hour or a day, but for a lifetime. Concerning the virtues of **Pomeroy** Windows—

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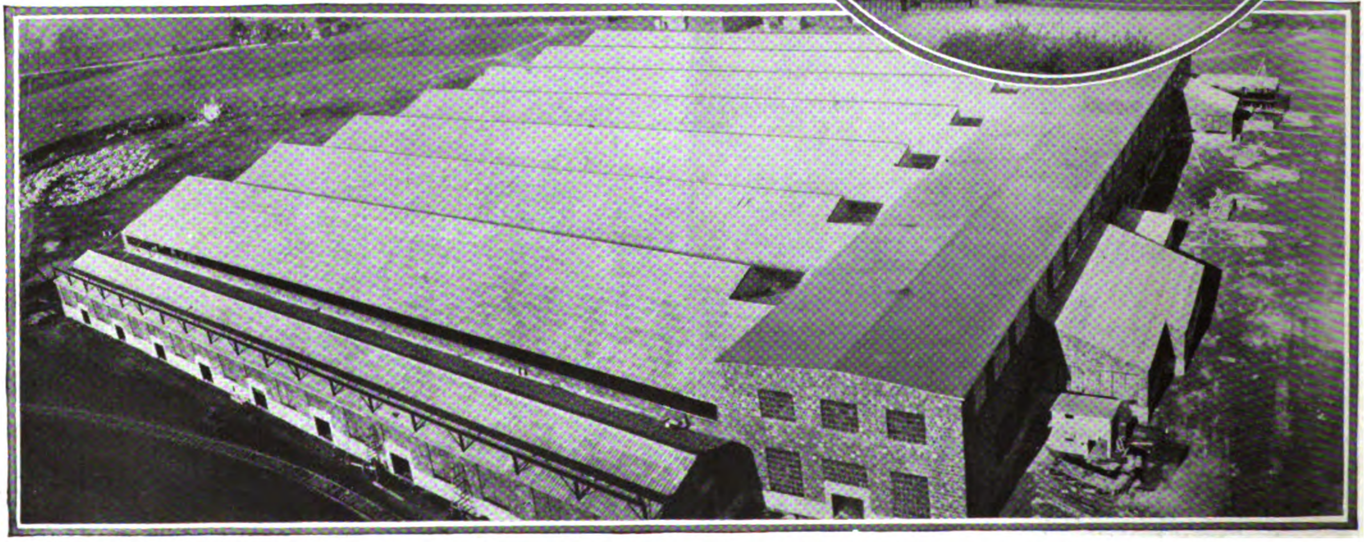

OFFICIAL JOURNAL OF SOCIETY ADVOCATING FIRE ELIMINATION

CONSTRVCTION

WITH A DEPARTMENT DEVOTED TO SAFE HOMES

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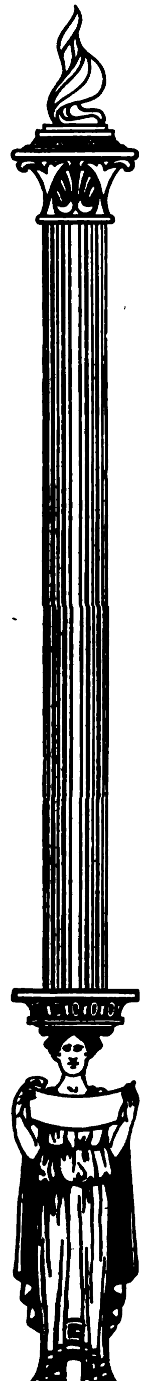

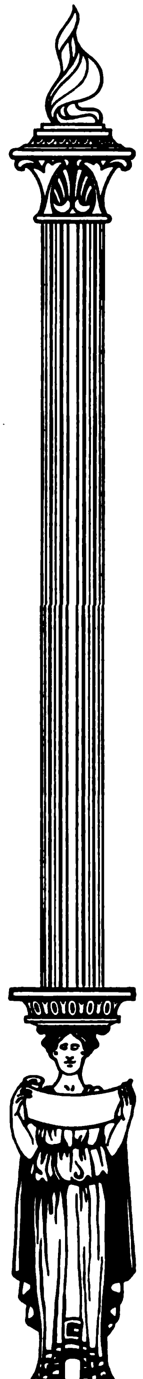

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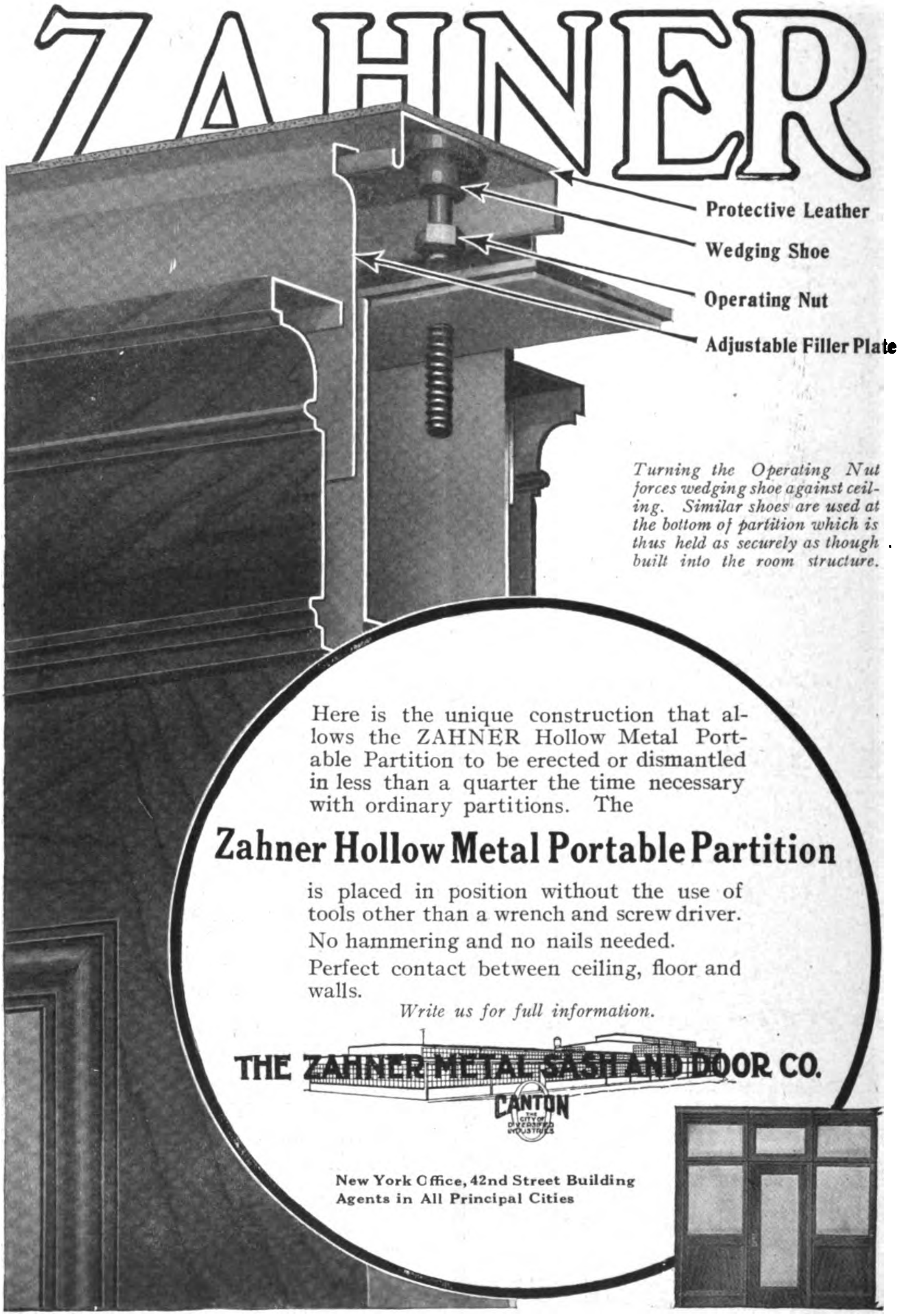

ZAHNER

Turning the Operating Nut forces wedging shoe against ceiling. Similar shoes are used at the bottom of partition which is thus held as securely as though built into the room structure.

Here is the unique construction that allows the ZAHNER Hollow Metal Portable Partition to be erected or dismantled in less than a quarter the time necessary with ordinary partitions. The

Zahner Hollow Metal Portable Partition

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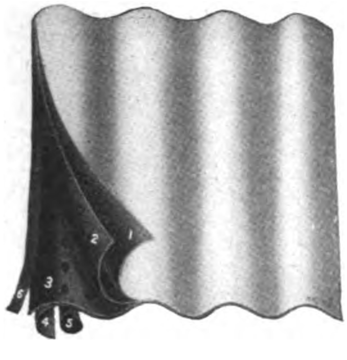
No hammering and no nails needed.

Perfect contact between ceiling, floor and walls.

Write us for full information.

THE ZAHNER METAL SASH AND DOOR CO.

New York Office, 42nd Street Building
Agents in All Principal Cities



1. **White or Impregnated Asbestos Felt.**
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4. **Impregnated Asbestos Felt.**
5. **Impregnated Asbestos Felt.**
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The same building considerations that dictate an ordinary galvanized roofing are more fully met and realized by the use of J-M Asbestos Corrugated Roofing. This roof has all the strength of Corrugated iron, because it has a core of corrugated iron, but in addition it has the permanent, solid-rock properties that protection of all-mineral (asbestos) adds.

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By combining the strength and rigidity of sheet iron with the permanence of two enveloping felts of asbestos and natural asphalt, this roof solves the problem of a permanent, no repair, safe covering. Write J-M Branch nearest you for literature and prices.

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Toronto Montreal Winnipeg Vancouver

Puts "Stick" in Stucco

Don't blame it on the plaster when the wall—inside or out—goes wrong. Lay it to the lath or whatever base was used beneath the plaster surface.

Kno-Burn

TRADE MARK

Expanded Metal Lath

is the always reliable plaster base because it is made with a mesh that completely and permanently imbeds itself in the plaster. Send for booklet 000.

North Western Expanded Metal Co.

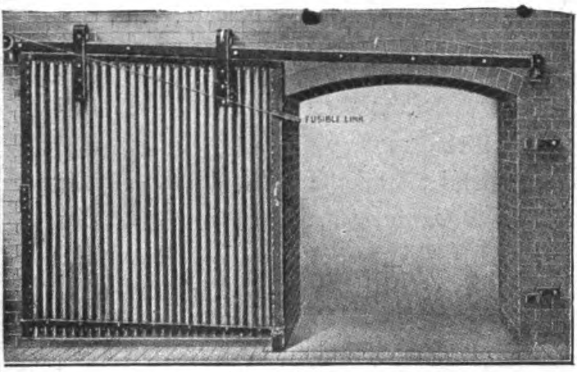
Manufacturers of all types of Expanded Metal

000 Old Colony Bldg. Chicago, Ill.

The Mesh that makes the plaster stick.

Saino SHEET METAL FIRE DOOR

Labeled by Underwriters' Laboratories.



Saino All-Metal Fire Doors and Shutters

Light, Rigid, Indestructible! Built for daily use. No wood to rot; no tin to rust; no repairs. Seventeen years without a replacement from fire, rust or rot.

SAINO FIRE DOOR AND SHUTTER CO.
BROOKLYN CHICAGO MEMPHIS, TENN.

"Build it of Standard Products
—Make it Consistently Firesafe"

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Are You Boosting For
Fire Prevention Preparedness?

Herringbone Home, C. D. Wright, Los Angeles, Cal.
Arch. F. B. Moesa

Herringbone

RIGID METAL LATH

LASTING satisfaction with stucco is assured when the base is a metal lath which strengthens the stucco, and produces a "key" that cannot be cracked or broken off.

Herringbone Rigid Metal Lath is preferred for just these reasons. Its stiffening ribs act as a staunch reinforcement for the slab—its strength permits 16 in. stud spacing without the least sagging or buckling—its flattened strands curl the plaster around to give a solid key, completely covering the metal lath, but without waste.

Architects specify Herringbone and experienced builders prefer to use it for their finest plastering work, both interior and exterior.

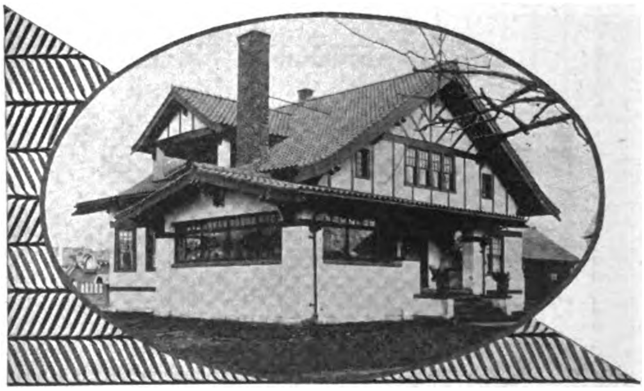
The Herringbone Catalog

a new edition, contains complete details, full specifications and many illustrations of Herringbone jobs. Mailed free on request mentioning firm name.

TRADE MARK
Reg. U. S. Pat. Off.

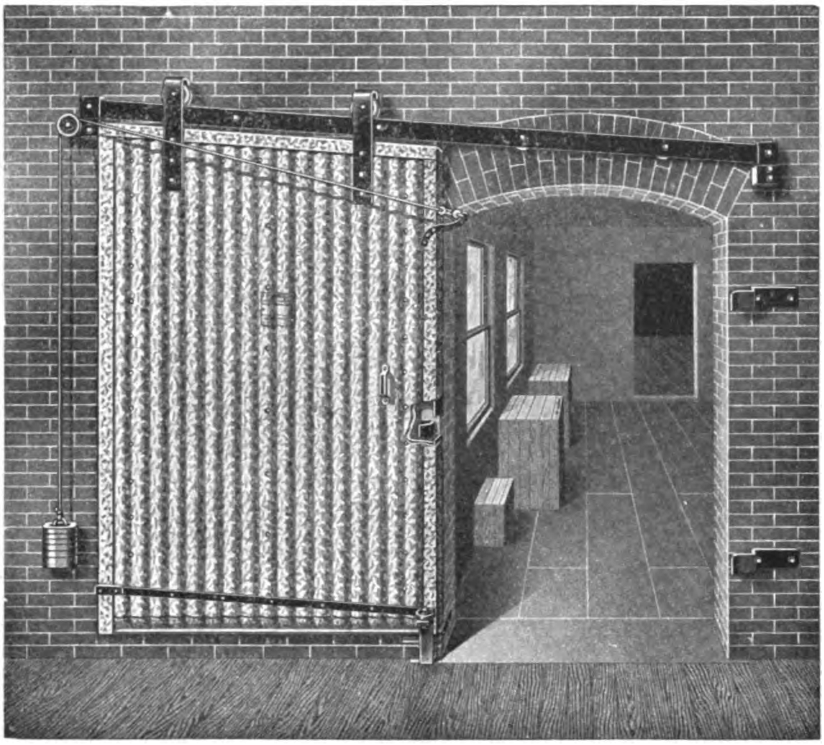
The General Fireproofing Co.
806 Logan Avenue, Youngstown, Ohio

Herringbone Home, G. W. Oliver, Rochester, N. Y.
Arch. W. J. Brockett



—EVANS—
"ALMETL" FIRE DOORS

(PAT. PENDING)



TYPICAL INSTALLATION—SINGLE SLIDING TYPE

PREPAREDNESS means PROTECTION

When you are ready to prepare plans for your new building, you should specify EVANS "ALMETL" FIRE DOORS (with our APPROVED Hardware) and have them properly installed. This will give you a reduction in your insurance rate and equip your building with the best building Opening Covering that is made.

Our Doors are constructed entirely of heavy steel and all exposed parts are galvanized.

They are lined with thick asbestos and are neat, durable, strong, light, easy to hang, cost almost nothing to maintain and can be installed anywhere.

They are *Fully Approved by the Underwriters' Laboratories.*

OUR OTHER FIRE PREVENTION LINES

"Merchant's Old Method" Roofing Tin
Fire Retarding "STAR" Ventilators
Metal "Spanish" Tiles and Shingles

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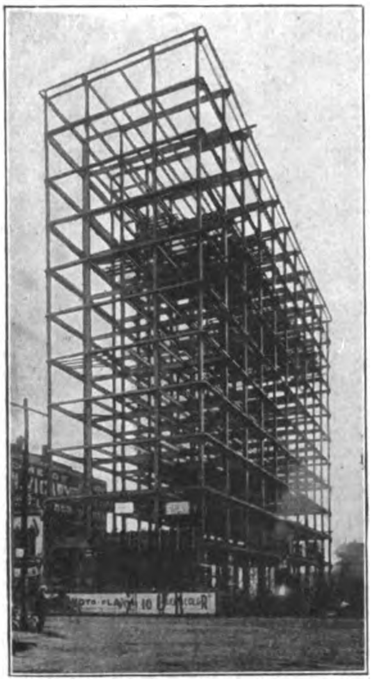
Baltimore
Wheeling

MERCHANT & EVANS CO.

SOLE MANUFACTURERS
PHILADELPHIA

Cleveland
Chicago
Kansas City

The Strongest, Most Durable, Fireproof Construction



Renkert Bldg., Canton, Ohio.
Walker & Weeks, Architects.

Berger's Metal Lumber

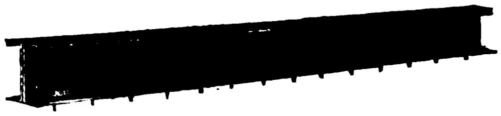
(Patented)

Official, practical fire, load and water tests have proven this modern structural material to be absolutely fireproof and indestructible.

Berger's Metal Lumber (made from a special analysis, heat-treated, double-grained steel) is replacing wood, piece for piece, everywhere. Used in 55 different classes of buildings, proving its adaptability, strength and permanency.

It can be used effectively in any building, from the small residence to the large skyscraper. Equally well adapted to interior partitions, outside walls and complete structures. It will withstand heavy loads. Moreover, it is sound, damp and rodent proof.

Send for Catalog L.'C. and Fire Test Bulletin.



I. Joist

THE BERGER MFG. CO., Canton, O.

Branches: Boston, St. Louis, New York, Minneapolis, Philadelphia, San Francisco, Chicago

Export Dept.: Berger Bldg., New York City, U. S. A.

If you are a Manufacturer *of* Firesafe Material or Protective Devices,

consistent presentation—in season and out—of your product in CONSTRVCTION cannot fail to result favorably because the success of this publication depends upon

(1) how well it advances and proves the argument for proper fireproofing

and

(2) what it actually accomplishes to increase the use of firesafe materials and devices.

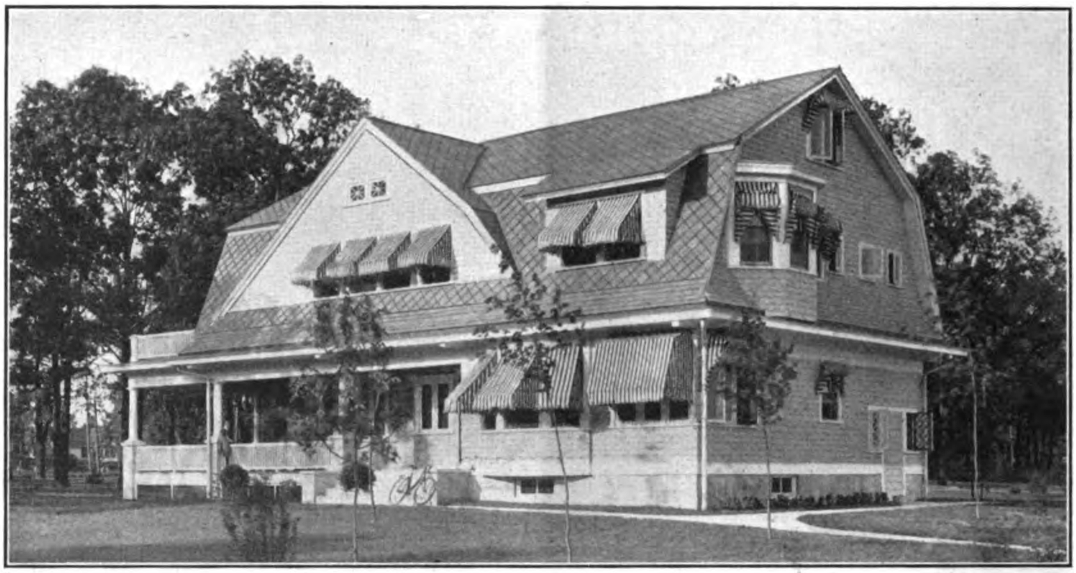
The first objective is attained (intensively) through the editorial, news and advertising sections of CONSTRVCTION and (extensively) by sending the magazine over the entire country to all the business and professional interests related to building planning, construction, equipment and maintenance.

The second purpose is accomplished by ***actively fighting for legislation favoring firesafe construction*** **and against laws permitting the continued use of wood——and remember that no company can do this work as effectively as a publication, that the "fireproofing fraternity" at present is a composite unorganized body comprising a number of separato units representing more than a dozen industries, that there is practical need of a national mouthpiece such as you have in CONSTRVCTION, that** ***makers of fireproof materials are now getting but one per cent of the business which ought to be theirs,*** **that advertising in CONSTRVCTION is helping yourself to get more orders, giving your goods the representation they deserve—and according this publication the co-operation it merits.**

Close These Doors

—and each room immediately becomes a segregated unit—fireproof and firesafe. Dahlstrom Metallic Doors and Trim provide the convenience of communication in office suites to the exclusion of all fire hazard. Apart from wear-proof and fire-proof service they also contribute to the aesthetic requirements of the fine building. The baked-on enamel finish is equal in appearance to the finest woods from the view point of both grain and coloring. This finish is also elastic, sanitary and easily cleaned. Write for all the facts.

DAHLSTROM METALLIC DOOR COMPANY
Executive Offices and Plant
61 Blackstone Avenue : : Jamestown, N. Y.
New York Office, 130 East 15th Street **Branches and Representatives in All Principal Cities**



Residence of A. W. MacCallum, Architect, Merchantville, N. J.
Illustrating the versatile effects obtainable with Ambler Asbestos Shingles Century Brand and Ambler Asbestos Sheathing.

What Roof Will You Recommend?

The fires of Augusta, Nashville and Paris have burned out and the accusing fingers of fire-marshals and level-headed citizens are pointed at combustible roofing. You will specify a fire-proof roof, of course, but why not give your customers

AMBLER
Asbestos CENTURY BRAND Shingles

The Roof That is as Permanent as the Foundation

The one roof that is at once beautiful in appearance, fireproof, waterproof, stormproof—which never needs repairs.

Made of cement and asbestos, Ambler Asbestos Shingles Century Brand *cannot* burn. The fibres of the asbestos twine and intertwine through the cement, reinforcing them far more thoroughly than steel rods reinforce a wall. They cannot break.

Every Ambler Asbestos Shingle Century Brand is subjected to a compression of 700 tons to the square foot; there are no air holes through which water may filter.

Perfectly impervious to water as a unit, our system of application locks a roof of Ambler Asbestos Shingles Century Brand into one waterproof, storm-proof, fireproof whole.

An Ambler Asbestos Shingle Century Brand roof, when properly applied, is cheapest in the end.

Get our Builders' Book—gladly sent on request.

KEASBEY & MATTISON COMPANY

Dept. B-3 **Ambler, Pa., U. S. A.**

BRANCH OFFICES IN PRINCIPAL CITIES OF THE UNITED STATES.

CONSTRUCTION
WITH A DEPARTMENT DEVOTED TO
SAFE HOMES

VOL. II JUNE, 1916 No. 6

Common-Sense
Home Building

A Plain Talk to the Man-about-to-own-a-home and to Architects, Contractors, Builders and Building Officials

THIS is to be a plain talk to the great fraternity of American homebuilders; not so much to those who plan and construct, or own magnificent homes, the manor houses of great estates, or the urban palaces of wealth, but to those who have to do with the planning and construction of homes of the everyday man—houses which line the outlying avenues and streets of all our towns and cities, houses which vary in cost from $3,000 to $10,000, and are erected by tens of thousands thoughout this country every year. These are the *real* American homes, and to those who dream the age-old dream of "owning our own home," who are planning to build or buy; to the architect to whom they will come for advice; to the speculative builder from whom they may buy—to every person interested officially or selfishly in every dwelling community in America, the plain truths of the following pages are offered for careful consideration and honest guidance.

The "Ash Rake" vs. Ignorance

Undoubtedly some toes will be trod upon, some interests offended, by statements which will be made here. Truth, even as medicine, sometimes hurts when it heals; but hurt as it may, and without ethical regard or political editorialism, some very plain facts must be set down in a truthful consideration of common-sense home-building.

The very term, common-sense home-building, consti-

Courtesy "The Interlocker"

tutes in itself an implied criticism of the methods of dwelling construction in general use in this country, and harsh criticism is undoubtedly deserved, particularly on the one point of the lack of provision of safety against the fire hazard, the hazard of conflagration and communicated flames.

That ancient and famous weapon, the "muck-rake," is not to be taken off the shelf and polished for use here; in fact, CONSTRVCTION has a new and better weapon, which we will call the "ash-rake," with which it has for some time been exploring those present-day middens, the ash-heaps of our national annual fire loss, looking for real reasons for the immense unnecessary destruction of natural wealth, which is the direct result of disastrous fires, and which carries with it indirect losses of staggering magnitude. And the "ash-rake" has proved a valuable tool. Among its finds have been some very interesting facts about the unsafe construction of the average American home, and reasons for the existence of conditions which will allow such destruction to continue. There are two reasons for this—the usual reasons for the continued existence of wrong conditions respecting public welfare—ignorance and greed. In our consideration of common-sense home-building we will consider ignorance only, leaving the factor of greed for the "muck-rake" and to the imagination.

A Nation of Woodbuilders

The people of America are, by heredity and environment, a nation of woodbuilders. Our forefathers found here in abundance the easiest workable material in the form of vast virgin forests, and houses, and even town halls and churches, were quickly constructed of hewn logs. Then came the development of sawmills and woodworking industries, which resulted in frame houses and wood shingles for roofing purposes. The use of burned clay and cement in its various forms for homebuilding is a comparatively recent development in the building field, and was the result of a demand for materials of a more permanent and solid nature than wood. During all this time very little attention was paid to the subject of safety against fire, and it is only within a very short period of time that the significance of the fire peril in dwelling-house districts has been given any thought or particular attention.

You may laugh at the statement that we are *still* a nation of woodbuilders, and point to row after row of brick houses, stucco houses, tile and concrete houses—to thousands of larger buildings of brick and stone, of steel and tile and concrete and gypsum; and you may say that this is the age of safe and permanent construction. But mark well the fact that *not one in ten persons* can name two kinds of shingles which will not burn readily, *not one person in one hundred* ever thinks of connecting frame exteriors and wood shingles of the ordinary house with the possibility of a serious loss by communicated flames; *not one person in one thousand* knows that shingles of asbestos and cement, clay, tile, slate, steel and asphalt are obtainable at reasonble prices from nearby building material dealers, and, strange to say, lumberyards. Perhaps not so strange after all, for the lumber dealer is in many cases developing into an excellent salesman for unburnable building materials, and thereby showing sound common sense and the spirit of progress.

Increasing Interest in Safe Homebuilding

This, then, is the average man-about-to-own-a-home. Through no fault of his own he is lacking in knowledge of the subject of safe construction. The very term "building" conjures in his mind the vision of a lumber

Courtesy the Interlocker

HOUSES OF INTERLOCKING TILE, IN WEEHAWKEN, N. J. P. J. Rock, Architect and Builder

Courtesy the Interlocker

BUILDINGS WITH HOLLOW TILE, WEEHAWKEN, N. J. P. J. Rock, Owner, Architect and Builder

pile, and the lumber pile, instead of connoting fire danger, to him simply means easily workable material with which he is accustomed to seeing houses built!

The first stirring of a common-sense movement to make the exterior of homes safe from fire is being felt throughout the country. Straws are beginning to turn to the course of the wind. Here and there small communities are insisting on firesafe homes. The criminal wood shingle roof is beginning to come in for its share of unpleasant public attention—towns and cities are legislating against it. Reliable newspapers, ever keen to champion public welfare, are beginning to denounce the wood shingle roof and the house with frame exterior and inflammable cornices and porches. New forms of unburnable materials, the so-called "substitutes" for the wood shingles, are rapidly becoming popular. The house of brick or stucco or concrete is becoming preferable to frame structures in the public mind. And why?

To a certain extent it must be due to the lesson of burned cities, great conflagrations, many of which started and fed on the wood shingle roofs and frame exteriors of dwellings until they had reached sufficient magnitude to wipe out the mercantile sections. Again, while it is undoubtedly true that we of America have taken destruction by fire as part of our national existence, still there is a growing realization of the value of conservation which is evidenced by the continually improving building laws in our great cities. So, too, the spirit of safety is spreading out into the suburbs. The question of an equalizing cost is naturally having a good effect in encouraging the use of masonry walls and safe roofing. Wood in its various forms for building construction has been continually advancing in price, and to a certain extent has depreciated in quality. You do not get today the same shingle that the old shingle mill by the river turned out. Asbestos, cement, clay, gypsum, slate and other unburnable materials are being put forth in perfected forms and combinations for homebuilding at very little increase on the cost of wood and offer the strong inducements of permanency and safety and lower cost of maintenance.

When we consider this increased interest in firesafe home construction and realize how perfectly it fits in as an all-important factor in the common-sense building of homes, immediately many questions enter the mind of the prospective builder. How much more will it cost? What material shall I use? What kind of roofing? The answer is to be found in the office of an architect who has had experience in planning houses of masonry exteriors and fire-retardant roofs. He may not encourage that type of construction from the standpoint of safety against fire. Unfortunately there are few architects that do so—yet. Safety is overshadowed by the esthetic sense and allied with the element of high cost in the mind of the average architect.

Where the Average Architect Fails

We are well aware of the fact that to impute failure in any sense, or weakness of any sort, to any member of the honorable profession of architecture is unethical and will be cited by the architect as being uncalled for; but in consideration of the subject of protection of buildings of any type against fire, and the need of such protection, we confidently make the assertion that the average architect has much to learn. It is but natural that this should be so, for this matter of firesafe construction is only in its first growth. New facts are being brought out and theories proven, new forms and applications of unburnable materials are being presented in surprising numbers. But there is one thing that the average architect can do, something that he

Courtesy Sandusky Cement Co.

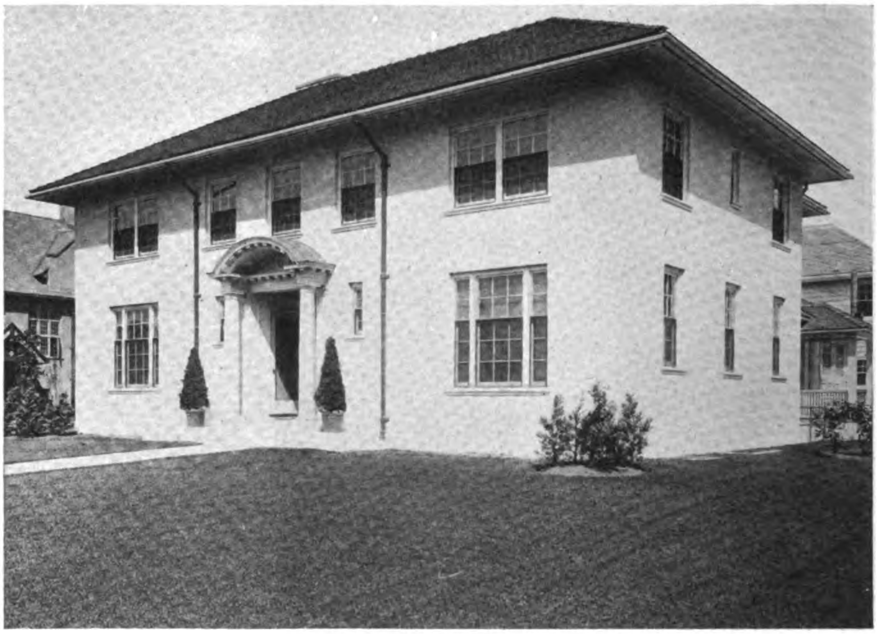
Residence of Dr. C. E. Glynn, Davenport, Ia.

Exterior stucco of waterproofed white Portland Cement

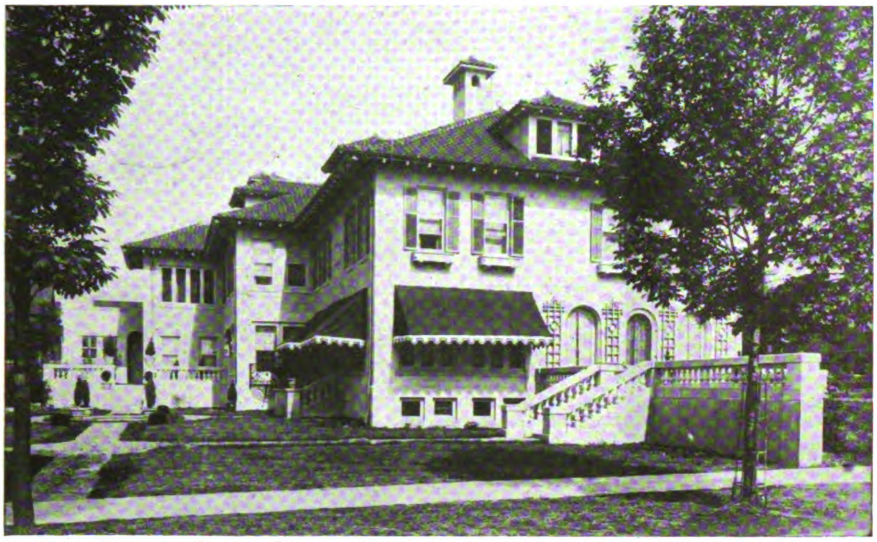
does not seem particularly inclined to do, and that is to spend time making a careful study of the fire loss and its relation to his business, and then he can be of distinct service to his community and his clients by recommending masonry exteriors and fire-resistive roofing for dwellings. Architects, as well as physicians and attorneys, are subject to the direction of their clients; but at the same time their advice carries weight, particularly when such advice can be backed by absolute and indisputable truths and staticstics. To recommend that the exterior of a client's proposed home shall be safe against flying sparks and brands should be considered a moral responsibility. To belittle the danger of communicated flames, to advocate the use of the wood shingle roof because of its esthetic quality and in spite of its proven menace, to influence in any way toward the use of the type of house construction which has proven dangerous and disastrous in thousands of fires, *consti-*

I. H. Verry Residence, Worcester, Mass.

Waterproofed white Portland cement exterior on hollow tile



Courtesy Sandusky Cement Co.



Courtesy Sandusky Cement Co.

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Residence
of L. Livingston,
Davenport, Ia.

Exterior finish of waterproofed
white Portland
cement

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tutes nothing short of malpractice of profession.

Immediately here enters the question of cost. An architect of good standing and a successful planner of homes was discussing this very subject with the writer within the last few days.

"The factor of additional cost—cannot recommend the spending of more money, *et cetera, ad infinitum.*"

"But," we said, "do you realize that the additional cost of masonry exterior and firesafe roof is only from 6 percent to 10 percent?"

"On paper—yes," he answered, "but when it comes to actualities!"

Actualities! If any moderate priced home, anywhere in this country, which is built with masonry walls and fire-resistive roof costs over 10 percent (maximum) additional to the cost of the same building of good frame construction, and having a wood shingle roof, then the fault of such cost lies at the door of the architect who designed the house—he has a great deal to learn.

Proof? Let any architect or any person who takes exception to this statement visit the New York office of CONSTRVCTION, or the office of The Society Advocating Fire Elimination, at Cleveland, O. There they will be shown dozens of plans of firesafe homes varying in cost from $3,000 to $10,000, and none of which call for more than 6 percent above the cost of producing the same house in wood. This matter of cost will be taken

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Residence
of E. W. La Plant,
Cedar Rapids, Ia.

Waterproofed white Portland
Cement used for exterior
finish on hollow tile

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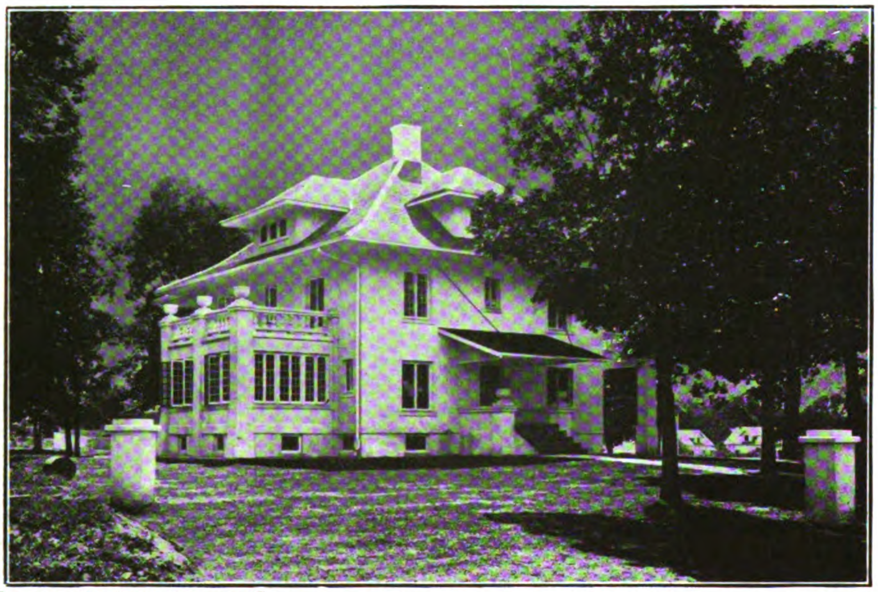
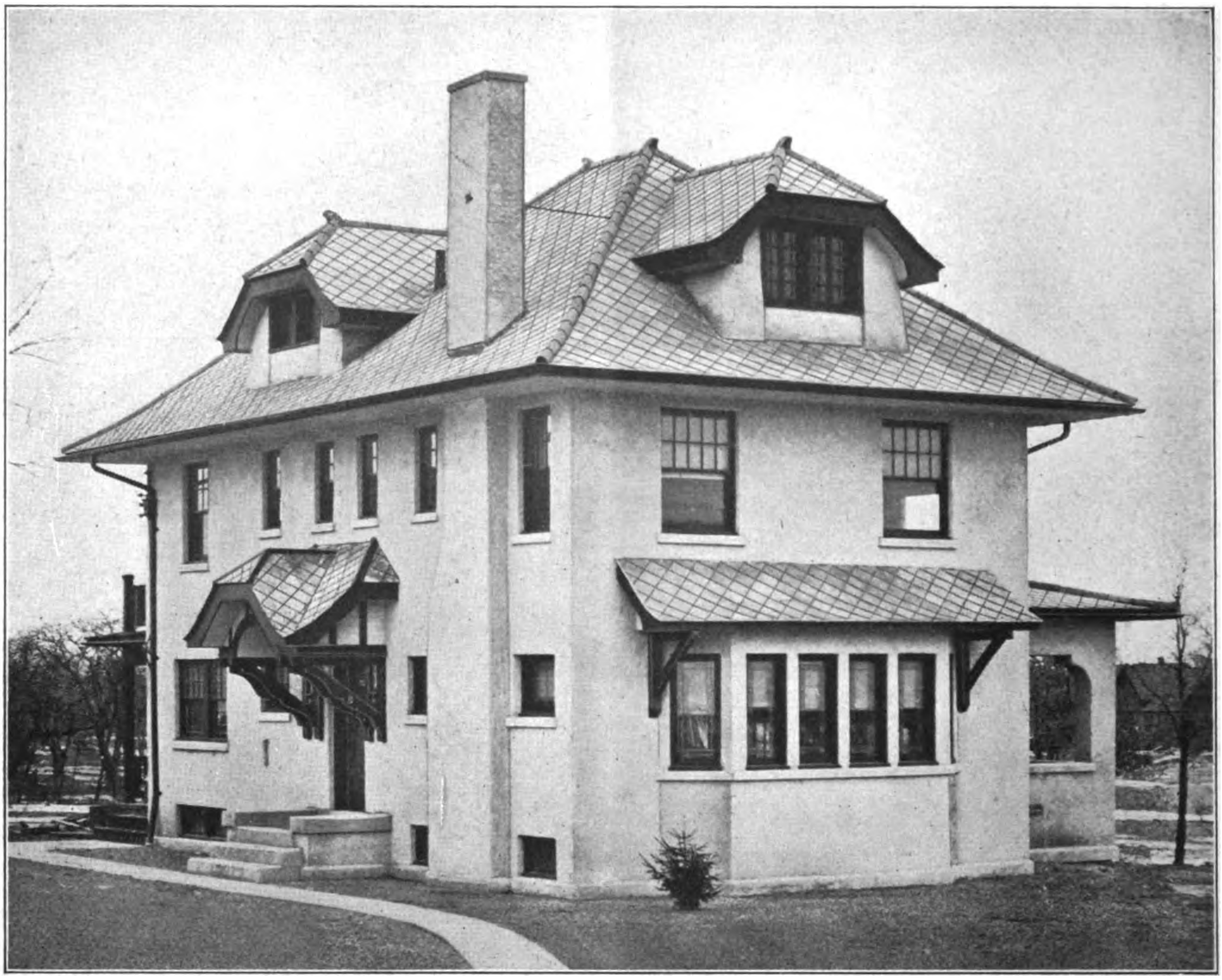


Courtesy Sandusky Cement Co.



ASBESTOS SHINGLED ROOF ON RESIDENCE OF RAYMOND A. JOROLEMAN, FLOWER CITY PARK, ROCHESTER, N. Y. Chas. W. Eldridge, Architect

up in later paragraphs of this article.

The Æsthetic Standpoint

The resourcefulness of manufacturers of unburnable materials, combined with and stimulated by the visions of architects, has been the cause of the production of face brick in beautiful color tones and textures, cement colorings for stucco and molded forms of cement or clay (architectural terra cotta), which harmonize with any decorative structural scheme and open wonderful fields for the general and economical use of architectural colorings which rival those of the Italian and French Renaissance. Even hollow tile building blocks, which have been used to form the core for cement-plaster outer walls, are now produced in forms which are pleasing to the eye when used so that the pattern of the large blocks forms the exterior of the wall.

Wood, of course, has for ages been shaped into many structural forms, which vary from the grotesque to the beautiful, but always it presents the potential hazard of communicated flames. Every conflagration in history, from the destruction of the wooden tenements of ancient Rome to the recent destruction of Augusta, Ga., is directly and naturally traceable to wood used too freely in building construction.

Wood exteriors, too, need careful maintenance in the form of painting and repairing. As before commented on, the idea of building the home of masonry construction and fire-resistive roofing, need no longer bring visions of high cost beyond the limits of the average man's purse; nor need the thought of walls of clay or cement offend the esthetic sense. Frame exteriors and wood shingles cannot possibly present the sound, durable and artistic appearance inherent in products of the earth and fire.

Perhaps we have been a little harsh in our criticism of the average architect, but if this is true such harshness may be ascribed to enthusiasm and a sincere desire to spread the gospel of safe home construction throughout the land, benefiting architect and layman alike.

The moral, then, as directed to the man-about-to-build is: *Insist on having your house constructed so that it will resist fire from without.*

The Speculative Builder

If you, Mr. Man-about-to-own-a-home, desire to buy a home ready to move into, beware of the speculative builder with his rows of tinder-boxes, having changeable fronts and all improvements, also keep a wary eye for the allotment or development which is already built up thickly with frame houses. If you buy a frame house or move into a section which is thickly built up with frame houses, you are courting danger and placing the lives of your family and the goods of your household in jeopardy.

The average speculative builder is no friend of fire-safe construction. It is much easier to slap together a lot of misfit and inferior lumber, cover it with bait for the Fire Demon and make of it a whited or browned or yellowed (according to the color of the paint) sepulchre than it is to build masonry walls and put on safe roofing. In other words, it is much easier to "skin" a lumber job, if we may be permitted to use a speculative trade term, than a job where brick or tile or concrete, with a roof of unburnable material, forms the exterior.

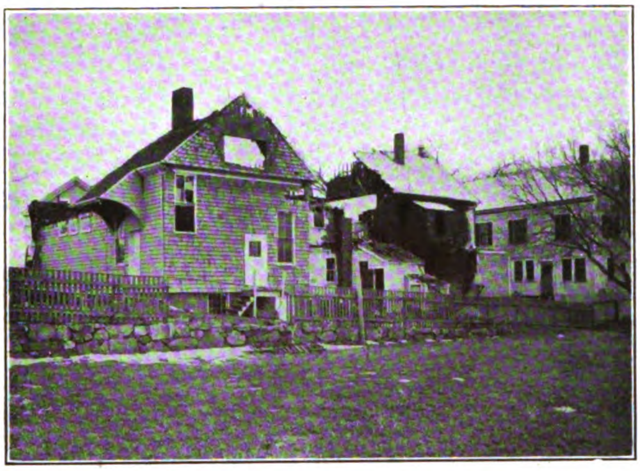
It must be realized that this statement does not apply to the honest builder, who really takes pride in his work and builds fairly and truly with good, clear lumber and shingles. He is simply mistaken—behind the times! His house should not be purchased, because it carries with it too much of the potential fire hazard.

Put your valuable goods and chattels in a safe and your invaluable family in a safe home. Then, and then only, will you be proceeding along consistent lines.

It is interesting to note that a number of speculative builders are reading the signs of the times and turning to the exclusive building of safe homes. With them the frame house and shingle roof is a thing of the past and their advertisements do not hesitate to say so. These men are on the right track, and the best advice that can be given to the speculative builder is to look into this matter of safety against fire. It pays!

Cleveland, Ohio, perhaps more than any city in this country, is leading in the spirit and production of safe homes. This fact is undoubtedly due to the splendid efforts of the Society Advocating Fire Elimination, which has entered into and carried on most successfully the work of encouraging the designing of safe homes by

A typical asphalt shingle roof and brick exterior house. This roof provides safety from conflagration danger



The asbestos shingle roof stopped the spread of this fire

the architect, the building of safe homes by the builder and the demanding of safe homes by the prospective buyer.

In that city many builders are devoting their entire attention to the construction of masonry houses at reasonable cost, and local architects are bringing out admirable designs of safe homes at low cost. In several sections of Cleveland entire allotments of firesafe homes are being built. The good influence of the movement spreads from neighbor to neighbor, and results in great benefit to the community. New York City has dozens of outlying developments which contain hundreds of masonry exterior homes, and in some of which frame houses are restricted against.

Community Benefit and Selection

This matter of community benefit is an important one, and one which the average home-builder or buyer is liable to overlook. When the average person looks for a location in which to invest money in a home, he takes into consideration the beauty and convenience of the locality and the factor of environment, the spirit and type of the neighborhood. But he usually, and through lack of knowledge on the subject, leaves out the important question of safety against fire. Think a little of some of the newspaper headlines in regard to any great conflagration, such as Salem, Mass., or the recent ones at Paris, Texas; Augusta, Georgia, and Nashville, Tennessee. The principal part of the news had to do with the loss of homes by fire, the privation and suffering of the people, who, having their homes burned from over their heads, knew not which way to turn for assistance. What of your family under similar conditions? Will you think of the question of fire safety *now, before you are burned out,* or will you *wait until the lesson is burned into your mind?*

The remedy is two-fold. First, you have a wide choice of localities and may be fortunate enough to find one where wood shingle roofs and frame exteriors of dwellings do not predominate. Buy or build there—and build safely. If you must go into a community where the potential fire hazard is high, at least do not think that you must be tarred by the same brush. Build so it cannot burn and your house will serve as a stop against fire, unless the conflagration has grown beyond all bounds. At least, if your house has a masonry exterior and a roof of fire-resistive material, you are not going to suffer from the sparks of your own or your neighbors' chimney or the flying brands from a nearby fire.

Merits of Individual Materials

The matter of the merits of the individual materials used in masonry construction and safe roof construction is not for discussion in this article. This subject has been covered very thoroughly in past issues and will be treated often in the future. Any questions which may arise will be cheerfully answered if directed to the office of this publication.

Courtesy "The Interlocker"

Attractive homes having walls of interlocking tile

The Cost Question

One subject which we will touch upon, however, is the all-important cost question. The slight increase in cost involved in safe construction of the home is the best investment a man can ever make. If the walls and roof of the house are of fire-resistant material, fully 60 percent of the fire hazard is overcome. In the interior it is not necessary to eliminate wood from the finishing. There is no objection to trim and doors, and even the floors above the first may be of wood.

The basement should, by all means, be cut off from the rest of the house by a masonry floor, protected stairway and fireproof doors connecting with the first floor. Partitions should be of fire-resistive material in order to check the rapid spread of flames. In other words, think of fire as it really is and use common sense in the construction of the house.

In most localities a house of this type is credited with a noticeable reduction in insurance cost. Naturally, too, the cost of maintenance is reduced, painting and repairs are not necessary. Another saving factor is the matter of depreciation. A frame house with wood shingles, built as they are today, will depreciate just three times as quickly as a masonry house with a common-sense roof. Here, then, is more than interest on the slight additional investment. Here is a payment back on the principal, so that the average safe home in the short space of five years has repaid its additional cost, is practically as good as new (which a frame house would not be) and has at all times afforded protection against the severe fire hazard.

When one travels the length and breadth of this rich and thriving country and studies the people in their homes; when one sees with understanding eye the devastation by fire in great conflagrations and the sufferings of the homeless; when one realizes that thousands of homes are continually being destroyed by smaller fires in every part of the land and that every home represents perhaps great effort on the part of its owner and his family; that in its destruction associations are severed, lives jeopardized, then, indeed, comes a feeling of wonder that this nation of home-loving people has not awakened to the need for the prevention of fires by proper construction and the use of unburnable materials.

The Part of Building Officials

The community spirit, the spirit of coöperation and conservation, has not yet enveloped the homes of this youngest of nations. There is no such thing as clearly developed public conscience or an understanding public mind. The melting pot has not boiled long enough over the fires of liberty. Therefore, we cannot hope to bring about both rapid realization and rapid public action in this matter of guarding against fire losses. Here, then, is where the officials having to do with the making and carrying out of laws relative to the construction of buildings can play the part of a good citizen and bring great benefit to the community. Building officials should be interested in means of safeguarding the community against the loss of life and property, and particularly should they realize and act against the fire hazard. Let building inspectors study the menace of the wood shingle roof; let them get unbiased testimony as the part such roofing has played in all the great conflagrations of history. Read the reports from fire chiefs from every part of the country and see how many fires come under the heading "Sparks on Roof." Then rule against the shingle roof, force it out of existence in your community; encourage the building of houses having masonry exteriors. Every masonry exterior is a check to spreading flames and an assistance to the local fire department.

The average building official does not keep himself up-to-date on this subject of the fire hazard. There should be more co-operation between the building officials, the chiefs of local fire departments and the makers of local building regulations. Just to cite one instance of this lack of proper co-operation we will briefly consider the case of Shreveport, La. Only recently the building inspector of the city in question, working with the chief of the fire department, brought before the City Council, in connection with the introduction of a new building code, a proposed section of that code which barred the dangerous wood shingle roof, making its use impossible anywhere within the city limits. Here was the building inspector, commissioned by the people to safeguard their interests, an inspector honestly awake to the best interests of his people, realizing through the fate of sister cities of the South the danger of the wood shingle and bringing this fact to the attention of the city fathers. Nor was he alone, for he had the testimony and strong backing of the man the community had set at the head of its guardians of life and property, the fire chief, who gave evidence of many fires within the city limits caused by sparks on shingle roofs, evidence that he had to set men as special guards of shingle roofs when there occurred a nearby fire. These two men, placed by the community for a specific purpose, were working together to carry out that purpose and afford the highest degree of protection to the community—and was their recommendation carried out? No! The city fathers apparently liked the idea of keeping the fire department employed—or they were ignorant—ignorant of the menace of the wood shingle roof and slow to consider the indisputable facts set before them. The activties of certain of the lumber interests in regard to the Shreveport Code? We promised to leave the "muckrake" untouched.

Conclusions

The more pretentious homes of America are built preferably of brick, stone, hollow tile or concrete, because of exthetic qualities, durability and the sense of permanence which is afforded by these materials. Those who have foolishly allowed their magnificent summer homes to be constructed of wood are in constant peril of dangerous fires, such, for instance, as those which have visited Long Island, where, within one recent year, six beautiful summer homes were destroyed at a loss of over $1,000,000!

Considering the facilities now offered for obtaining unburnable materials for the construction of the exterior walls and covering of the roofs of dwellings, and in view of the fact that such materials sensibly purchased and properly combined will not raise the cost of the average man's home to an amount in excess of that which he feels able to pay, it does not seem reasonable to believe otherwise than that every prospective homebuilder who reads this article will give very serious attention to this little appreciated and little understood subject of the provision of safety against fire by proper construction and the selection of unburnable materials.

Realization of the ever-present danger of fire communicated to inflammable exteriors of houses should in itself insure that provision against the fire hazard which is an all-important element in the common-sense planning of the home of the every-day man.

Only by forcing out the indiscriminate use of wood in the construction and roofing of dwellings can we hope to reduce the enormous fire losses. And as in every great national reform, it is the every-day man who will accomplish this end. He it is who must prove the strong factor in the matter of decreasing fire waste. Fire prevention, like charity, must begin at home and in the construction of the home.

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A new St. Louis organization, formed to construct the Hotel Statler in that city, is the Avenue Building Company. The intended structure, which will constitute the fourth of the chain of high-grade hostelries owned and operated by the Hotels Statler Company, Inc., of Buffalo, is to cost not less than $3,000,000, exclusive of its furnishings. Mr. Statler, the directing mind in the enterprise, was a recent visitor to New York City, and is credited with the intention of putting up another of his type of hotels in this city.

A $300,000 structure has been designed for the *Birmingham News*, of Birmingham, Ala., by Joy & Gallup, architects. The building is to be four stories in height; of reinforced concrete, and finished with tapestry brick and terra cotta trimming.

SLATE ROOF ON RESIDENCE OF JOHN T. GILLESPIE, MORRISTOWN, N. J. **Harrie T. Lindeberg, Architect**

Dwelling Houses—Common Faults in Their Construction, with Suggestions for Safeguarding Against Fire

Appreciating "that not one private house in a thousand is constructed with any serious thought regarding the safe escape of the occupants in case of fire, although the annual loss of life due to dwelling house fires is appalling," the National Board of Fire Underwriters has newly issued a most useful work entitled "Dwelling Houses: A Code of Suggestions for Construction and Fire Protection," the observance of which would go far toward reducing the heavy toll in life and property paid the fire fiend each year.

FROM the work in question, for the preparation of which the National Board of Fire Underwriters is deserving of a high measure of praise, we quote as follows:

FIRE LOSS STATISTICS FOR DWELLINGS

1. The following statistics, furnished by the new Actuarial Bureau of the National Board of Fire Underwriters, are compiled from true insurance loss values furnished by the insurance companies which are members of it. This is the first time such exact data have ever been collected and the figures given are undoubtedly the most accurate information upon the subject thus far published.

2. The compilers believe the values given represent over 90 per cent of the total insurance losses. They do not by any means represent the actual loss to the property owners, for large values not covered by insurance are destroyed in every State annually. State Fire Marshals who have studied this subject, and who have some data upon which to base an opinion, estimate that the actual property loss would be an increase of 25 to 33 per cent upon the insurance loss.

3. Only thirty-eight States are included in the statistics given, these being the only ones available as this pamphlet goes to press—complete data for all States will be published later. It will be noted that many of the States given are those having a scattered population with probably a preponderance of frame construction and a minimum of public fire protection. These facts do not distort the results so far as the States themselves are concerned, but may lessen their value somewhat for forecasting general conclusions for all States.

4. The term "dwelling," as used in the statistics, is not restricted to the definition of the word employed in this pamphlet, but includes tenements and apartments, except those which have portions of the buildings devoted to commercial purposes; those are classified elsewhere. In the majority of States reported, the proportion of the tenement class of residence buildings would be relatively small, so the figures given probably indicate fairly well the losses on ordinary dwellings. The figures cover both buildings and contents, and no distinction is made here between buildings protected by public fire service and those unprotected.

5. Total insurance fire loss from all causes on dwellings in thirty-eight States for the year 1915:

Brick dwellings and contents	$ 2,343,655
Frame dwellings and contents	22,310,524
Total	$24,654,179

These values are distributed among the different States as follows:

	Brick Dwellings	*Frame Dwellings*
Alabama	$11,218	$1,093,670
Arizona	13,651	84,116
Arkansas	9,199	681,418
California	17,189	2,078,989
Colorado	55,418	200,183
Connecticut	72,888	456,590
Delaware	9,785	32,245
Florida	3,916	618,379
Georgia	12,387	1,093,178
Idaho	2,049	231,726
Illinois	591,487	2,022,666
Indiana	33,226	1,020,970
Iowa	22,303	683,501
Kansas	10,165	456,357
Kentucky	50,889	780,576
Maryland	177,924	303,063
Michigan	117,072	1,079,767
Minnesota	28,350	733,292
Mississippi	19,498	921,749
Missouri	487,370	1,280,755
Montana	1,834	181,280
Nebraska	7,666	275,687
Nevada	475	25,661
New Hampshire	4,377	347,650
New Mexico	10,597	61,708
North Carolina	5,934	416,100
North Dakota	1,104	135,255
Oklahoma	1,453	463,787
Oregon	1,664	411,584
Pennsylvania	388,402	1,526,567
Rhode Island	81,244	318,660
South Dakota	89	96,870
Tennessee	24,159	926,377
Utah	19,191	67,047
Vermont	1,633	92,484
Virginia	28,196	515,198
Wisconsin	18,658	568,990
Wyoming	995	26,429

6. The three leading known causes of fire in nearly

every State were chimneys and flues, sparks on roofs, and gasoline or other petroleum products. While accidental causes occasionally reversed the order in which the hazards operated, or gave unusual prominence to a minor cause, the general facts are clear and in accord with previous conclusions. The necessity for special precautions to counteract these devastating influences is plainly indicated.

7. The wide variation in loss upon frame and brick buildings for every State recorded is significant. However, as the number of buildings involved in the figures is unknown, it is impossible to draw definite conclusions regarding the relative fire hazard of the two types of construction. Considering the States concerned, it is probable that the risks covered a considerable excess of frame buildings, and if so, would account in some degree for the disparity in losses; nevertheless the fact that there is extreme difference in favor of brick buildings in every State named, is worthy of consideration. The statistics for the current year will include the number of buildings in each class tabulated, and will therefore furnish more complete data upon which to base conclusions.

Cost of Dwellings No Measure of Fire Resistance

As a general proposition, the cost of a dwelling bears little relation to its fire-resisting ability. The effects of a fire are practically the same whether a house costs $3,000 or $300,000. The same defective construction exists in both, and unless the fire is controlled by outside agencies, the destruction is swift and complete. In recent years there have been a large number of very costly suburban and country houses burned in different parts of the country with an aggregate loss of many millions of dollars. The majority of these beautiful buildings could doubtless have been saved in whole or in part, if they had been built in accordance with the principles advocated in this pamphlet. It is a practical certainty that the owners of these buildings would have gladly incurred the additional expense necessary to have made them in some degree fire-resistive, if their architects had called attention to the simplicity of such precautions and the resulting decreased hazard. Ordinary business prudence should insure that such costly residences be made as fire-resistive as possible, particularly when remotely situated from public fire protection.

Reasons Why Dwellings Burn Freely and the Remedy

1. The proportion of dwellings which catch fire and are a total loss, or which have building and contents ruined, is very high. The reasons are plain. First, in cities such buildings are usually located in outer areas more or less romote from fire fighting apparatus. Many are situated outside of city limits, or in villages or suburban developments where fire protection appliances are meagre and unreliable. Then there are vast numbers scattered all over the country which are entirely unprotected. Second, dwellings are generally small and low, so that a fire well started before discovery is likely to envelop all portions before outside assistance can become effective. Third, the majority of dwellings are of very combustible construction, with open stairways lined with varnished or painted woodwork connecting all stories, and with no provisions for arresting the spread of fire from floor to floor or from room to room. The cellar, where the heating appliance is usually located, often contains much combustible material, a combination which is dangerous. Moreover, the cellar is more or less directly connected by open channels with all parts of the house, including the garret. This results from lack of proper protection around water, gas and steam pipes, hot air pipes, dumb waiter shafts and open spaces through walls and partitions. Fourth, the nature of the occupancy is such that much of the time there are not enough able-bodied occupants present to do effective fire fighting from within.

2. These four conditions combined result in the enormous annual property fire loss, and the sacrifice of many lives. The lamentable feature of the situation is that a large part of this loss could be prevented by reasonable precautions in construction and careful observance of the ordinary rules of fire protection. The cost of the former would be comparatively small; the only expenditure for the latter would be a little thoughtful vigilance.

3. The cost of stuctural fire barriers necessary for reasonable protection to a dwelling house amounts to but a small percentage of the total cost of a building. For this reason it is hoped that architects and owners will adopt them once their attention is directed to the reduced hazard resulting from a little intelligent thought and care. Speculative builders who erect houses to sell, and build them as cheaply as possible with slight regard to utility, will perhaps be disinclined to adopt alterations which will *add anything* to the cost. However, even these should be convinced to the advantage gained as an advertising medium by the introduction of such structural safety features. It is reasonable to assume that a prospective home purchaser would be very favorably impressed with the idea of buying a house in which all precautions had been taken against the spread of fire.

Classification According to Construction

1. Dwellings in this country consist essentially of four types as regards their method of construction.

Type I. Buildings fully protected, properly called "fireproof," in which all structural parts, including doors, windows and trim, are of incombustible construction. Some buildings which belong in this class have minor doors and windows of combustible construction, but where these do not serve as important cut-offs, or are not likely to be subject to serious fire exposure, their presence in the building would probably not materially increase the hazard.

Note:—All varieties of interior trim are now made of sheet steel, and so beautifully finished they are difficult to distinguish from handsome wooden trim. Metal trim costs more than wood, and requires a skilled artisan to install it, but *it will not burn,* and this is a compensating advantage that should be seriously considered by those who can afford to buy it. Wooden trim treated by some process to render it fire-resistive would be entirely suitable for use in a house where the owner desired an incombustible trim, but wished to preserve the artistic effect of wood color and grain. There are companies which make a commercial business of treating lumber for such purpose, but of course it increases the cost. Still it is used quite extensively where necessity or a desire for a non-flammable trim justifies the extra expense. See note to par. 7, Section 56.

Type II. Buildings with partial protection; commonly (though improperly) called "fireproof." The term "semi-fireproof" would properly be applicable. Such buildings have walls, floors, roofs, and partitions of incombustible construction, but with wooden floor finish, wooden trim, and ordinary wooden doors and windows.

Buildings of this type usually have masonry walls with steel beams filled between with fireproof material for floor and roof construction, and partitions of terra cotta, gypsum, metal lath and plaster or other equivalent material; or they are of reinforced concrete construction throughout; or any other combination of the foregoing materials. Some moderate priced dwellings of this type have recently been erected with a light steel framework covered with metal lath with stucco and plaster finish on walls and partitions, and having concrete floors.

Type III. Buildings with walls of incombustible construction, but having all interior construction, including the roof, of wood. The roof covering being either wooden shingles, or some type of fire-resistive material. The walls of such buildings are either stone, brick, concrete or terra cotta. Usually generous wooden piazzas are attached.

Type IV. Buildings constructed entirely of wood, either with or without fire-resistive roof covering. Sometimes the walls are veneered with brick, or covered with stucco.

2. Except for precautions against open stairways, or other passageways through a house, very few of the recommendations of this pamphlet apply well to dwellings of Type I. Such buildings are in a sense ideal; and although an increasing number is being erected each year, the total is still very small.

3. The same is essentially true in reference to buildings of Type II. They are not subject to spread of fire through concealed spaces, which is the worst constructional defect in dwellings; nevertheless, they are liable to destruction due to fire communicating from one portion of the house to another through open stairways, aided by the free use of wooden trim, door, and windows. Many houses of this type have been built in late years, some being costly, and others medium priced buildings erected in groups for workingmen's houses in connection with industrial plants. Unfortunately their occupants are taught to have a feeling of security which often does not really exist. Experience has shown that because of faulty design, even expensive structures of this class frequently suffer a complete burn-out from an interior fire when outside aid is not promptly rendered.

With a little thoughtful care in the design of such buildings, and the exercise of prudence in selecting materials from trim, particularly where they are used in the planes of fire barriers, this class of residences can be made exceedingly safe. There are several methods of constructing non-combustible dwellings of this type which cost but little more than a frame building.

There is a prevailing belief that incombustible dwellings are impracticable because of excessive cost; as a matter of fact this opinion is not justified, for numerous dwellings of this class are being erected in different parts of the country at costs not exceeding 10 to 15 per cent over that of first-class combustible construction. Reputable contractors claim that in some localities the difference in cost is even less than this. If properly designed, such buildings not only furnish complete safety to the occupants, but reduce to a minimum the danger of a complete burn-out from an interior fire, and greatly lessen the hazard of ignition from burning of neighboring buildings. They are also rat and mouse proof, as well as having increased sanitary advantages.

4. As regards the last two types of dwellings there is little to be said in defense of their fire-resisting properties. Their weakness is well recognized. So far as the exterior fire hazard is concerned, Type III —that is buildings with incombustible walls—has a marked advantage. When an interior fire occurs, the chances of a complete burn-out in either type are more nearly even. All the recommendations of this pamphlet are applicable to these two types. It is hoped that the publicity given to the many prevalent defects in the construction of these two particular types of dwellings, together with the suggestions for correcting same, may serve to materially lessen the danger which such careless methods create.

5. It should be borne in mind, that many of the fire prevention measures recommended in this pamphlet can be put into a house at the time it is built with practically no extra expense, if specified in the plans before being submitted to contractors for bids.

Definitions

The following terms when used in this book shall be understood to have the meaning here given them.

1. *Approved.* The term "approved" refers to a device, material, or construction which has been approved by the Underwriters' Laboratories; or an approval issued by some recognized authority based upon satisfactory evidence of competent and impartial tests or investigations.

2. *Bearing Wall.* A wall which supports any load other than its own weight.

3. *Fireproof.* Refers to materials or construction not combustible in the temperatures of ordinary fires, and which withstand such fires without serious impairment of their usefulness for at least one hour.

NOTE:—It is recognized that the term "fireproof" is misleading and should be abandoned for the more correct term "fire-resistive"; but until the latter term has been authoritatively defined in a manner expressive of its elastic interpretation, it seems advisable to continue the use of the more common though objectionable word.

4. *Fire Door.* A door, frame, and sill which will successfully resist a fire for one hour in accordance with test specifications of the Underwriters' Laboratories, and has been approved upon such test.

(a) A self-closing fire door is one which is normally kept in a closed position by some mechanical device.

(b) An automatic fire door is one which is arranged to close when released by the action of heat.

5. *Fire Wall.* A wall built for the purpose of restricting the area subject to the spread of fire.

6. *Fire Window.* A window frame, sash, and glazing which will successfully resist a fire for one hour in accordance with test specifications of the Underwriters' Laboratories, and has been approved upon such test. No single pane in a fire window shall exceed 720 square inches.

7. *Incombustible.* Materials or construction which will not ignite and burn when subjected to fire.

8. *Non-bearing Wall.* One which supports no load other than its own weight.

9. *Parapet Wall.* That portion of any wall which extends above the roof line and bears no load except as it may serve to support a tank.

10. *Party Wall.* A wall used or adapted for joint service between two buildings.

11. *Wired Glass.* Glass not less than ¼ inch thick enclosing a layer of wire fabric reinforcement having a mesh not larger than ⅞ inch, and the size of wire not smaller than No. 24 B. and S. gauge.

In the highly important matter of roofings the statements and recommendations of the National Board are as here set forth:

APPROVED ROOFINGS

1. Wherever possible use a fire-resistive roof covering. The safety which it offers is well worth the additional expense. There is a variety of approved roofings on the market which will afford satisfactory protection and service; a number of them are but little more expensive than first-class wooden shingles. The first cost of a roofing material must be averaged with the years of service it will render in order to ascertain the real expense of maintaining the construction. The life of the best fire-resistive roofings is considerably longer than that of the wooden shingle, and this fact should be considered in selecting. Among the recommended roofings are tile, tin, slate, asbestos shingles, and other composition shingles and prepared roofings which have been tested and approved for fire-resistance and durability.

2. The fire-resistance of ordinary roofs can be considerably increased by covering the rafters on the underside with metal lath and plaster, asbestos mill board or asbestos building lumber, gypsum plaster board or any other incombustible heat insulating material. Such coverings add much to the comfort of the house by making the attic cooler in summer and warmer in winter. The insulation can be further improved by a two-inch layer of mineral wool placed between the rafters and supported by any of the board materials above mentioned. Gypsum plaster blocks could also be employed for this purpose. Such construction is particuarly advantageous when sleeping rooms are located in the attic.

NOTE:—It is recommended that a layer of non-flammable roofing felt be laid on the roof decking before tin roofing is applied. It serves as an insulator and would prevent ready ignition of the decking in case the tin were subjected to fire brands or severe radiant heat. It also aids in keeping the attic cool in hot weather.

WOODEN SHINGLE ROOFING

1. The great danger of the wooden shingle roof is from chimney sparks, or flying brands from burning buildings. Wooden shingle roofs, in combination with chimneys, defective or otherwise, have probably been accountable for more dwelling house fires than any other defect in construction or equipment. Records show that they are responsible for over 20 per cent of all fire losses in dwellings. The wooden shingle has also been justly called a "conflagration breeder," for experience has shown that many of our large conflagrations have been spread and rendered uncontrollable by the flying brand hazards of this material. It is well known that the high wind usually associated with a conflagration will distribute blazing shingles over an area several blocks in extent. There are numerous incidents of fires being started on shingle roofs by the burning of another over half a mile away.

2. The hazard of this typical American roofing has become so well recognized it is excluded from the fire limits of practically all cities where building laws are in force, and an increasing number are enacting laws forbidding its use anywhere within the corporate limits. However, in spite of this public disfavor and

its "criminal record," it is an unfortunate fact that the wooden shingle roof is still extensively used for isolated dwellings, and in many towns and real estate developments where considerable building congestion but no building laws exist; also in the outlying areas of the majority of our cities.

3. The reasons for the continuance of this evil are several, first of which is habit. It is easier and more natural to do the thing we are accustomed to do than to start somehing new. The second primary cause is low first cost of wooden shingles; third, the ease of application—skilled labor not being required; and fourth, the general distribution of the product—they being on sale in practically every town in the country. There are other reasons for their use, but all their advantages are overshadowed by their one great discrediting feature—their fire hazard. This menace is always present, and no sophistry or argument can remove it. Therefore the National Board of Fire Underwriters urges that wooden shingle roofs shall not be used where a safer roofing can be afforded.

4. When wooden shingles are used, their fire hazard should be recognized, and every precaution taken to make them as safe and efficient as possible. The life of the shingles can be considerably increased by treating them with preservative compounds. This can be done at the building, or treated shingles can be purchased in the market. Most of such compounds are in the nature of stains, which do not directly increase fire-resistance. However, indirectly they assist the shingles to resist fire in this way: A newly shingled roof offers much better protection from fire than an old one, because the shingles lie closely together and present a smooth, hard surface upon which sparks or embers are not likely to lodge permanently, but will roll or be blown off. On an old roof where the shingles are badly weather-worn and have curled and broken edges, the chances of sparks being held and igniting the roof are very greatly increased; therefore any treatment which will preserve the shingles and prolong their existence as a smooth roof surface will incidentally improve its fire-resistance.

5. Various methods of fire-proofing wooden shingles have been proposed, and the United States Forestry Service is making a systematic investigation of their merits and adaptability. It is hoped that some practical process may be evolved which will remove this serious drawback to an otherwise exceedingly useful material

If it is desired to collect rainwater for household purposes from roofs, it will be necessary to choose treated shingles which will not contaminate the water. Some preservatives have this objection.

6. A well known fire-prevention expert in New England has expressed his faith in a plan to protect a wooden shingle roof from conflagration hazard by installing a dry pipe along the ridge pole with perforations so placed as to spray the whole roof when water is turned on from a service pipe with which it would be connected. This would undoubtedly protect the roof from sparks or embers from any source, or extinguish an incipient blaze provided the occupants knew of the danger and turned on the water.

Skylights

All skylights should have metal frames and sash and be glazed with wired glass, or be protected above by heavy wire screens.

Note 1:—The purpose of this requirement is to prevent possibility of fire brands carried by the wind from some burning building breaking through a skylight and setting fire to the interior of the house.

Note 2:—Building codes usually require that a skylight over any shaft passing through a building directly to the roof, such as elevator, stairway, vent and light shafts, shall be glazed with thin glass. The idea being that if a fire occurred in the building and worked into the shaft, the heat would break out the thin ordinary glass, and so give vent to the heat and smoke. This would prevent the fire being forced sidewise through other portions of the building and at the same time give firemen a chance to control it. Such construction would scarcely apply to dwellings except those having considerable size and height, and presumably within the radius of public fire protection.

Roof Structures

All structures built above the roof surface, such as bulkheads, scuttles, tank houses, etc., should either be of fireproof construction or be covered with incombustible material.

Note:—Such structures are liable to be forgotten in the confusion during the burning of some nearby building. If they are not protected and the wind is in the right direction, the danger of their ignition from rdaiant heat and consequent firing of the upper story of the house before discovery is well known. The fact that such a fire would be in the most inaccessible place to fight increases the risk. A prudent person will make all the roof surfaces of his house at least nonflammable, and economize elsewhere if necessary.

Wood Shingle Roofs in Indiana

Of the $5,743,865 fire loss suffered in Indiana last year, upon the authority of State Fire Marshal W. E. Langley, $522,014, or nearly 10 percent, "is directly chargeable to the wood shingle roof." Continuing, Marshal Langley declares that "the general use of the incombustible roof will do more to cause a reduction in the number of fires and lessen the danger of conflagration than any other practice."

Approved by New York Board

The Bureau of Industrial Code of the New York State Industrial Commission has approved mechanical devices submitted it by the firms mentioned below:

Fire door of the Saino Fire Door and Shutter Company; Fenestra steel sash and wired glass window of Detroit Steel Products Co., and McCambridge metal-to-metal floor flange of the W. A. Case & Son Manufacturing Co., Syracuse, N. Y.

Sweepingly Condemns Wood Shingle Roofs

FEW persons, unless they have given attentive study to the matter, appreciate what a serious economic loss is sustained in this country every year through fires. Still less do they realize that the drain is largely preventable, and that it is the duty of every right-thinking citizen, and especially of public officials, to do all within their power to conserve property values.

Of the enormous annual fire loss the National Board of Fire Underwriters advises that property to the value of $22,050,000 was destroyed in conflagrations in 1915, and that thus far in 1916 (June 1), the conflagration loss is no less than $16,000,000. Adding that "much of this conflagration loss can be directly traced to the flying brand hazard of wood shingle roofs."

In support of its damaging statement the National Board of Fire Underwriters cites the following specific instances in which the flying wooden brand was the responsible cause for sweeping fire disaster:

Jacksonville, Fla., May, 1901; loss, $10,500,000. Yazoo City, Miss., May, 1904; loss, $2,000,000. Chisholm, Minn., September, 1908; loss, $1,700,000. Chelsea, Mass., August, 1908; loss, $12,000,000. Fortworth, Texas, April, 1909; loss, $800,000. Wallace, Idaho, July, 1910; loss, $1,000,000. Bangor, Maine, April, 1911; loss, $3,500,000. Houston, Texas, February, 1912; loss, $4,500,000. Hot Springs, Ark., September, 1913; loss, $2,225,000. Salem, Mass., June, 1914; loss, $13,000,000. Paris, Texas, March, 1916; loss, $11,000,000. Nashville, Tenn., March, 1916; loss, $1,450,000. Augusta, Ga., March, 1916; loss, $4,500,000.

In the light of the above, the National Board of Underwriters very pertinently ask:

"Can any city afford to continue to jeopardize its safety by allowing this severe hazard of [the wood shingle roof] to exist?" The question has been answered by numerous cities, but usually only after the dread danger of a conflagration has been brought home to the citizens by the destruction of a part of the city.

"Action is urged on all municipal authorities toward the elimination of these conditions: Augusta, Ga., and Paris, Texas, following the conflagration, adopted complete building codes, essentially as outlined in the building code recommended by the National Board of Fire Underwriters. Such a code should be adopted and enforced in all cities, but pending this it is extremely necessary to reduce the prevailing serious hazard of wooden shingle roofs by the passing of an ordinance restricting new roof coverings and extensive repairs to fire resisting surfacing.

"The National Board also appeals to the various civic and business organizations to lend their co-operation towards the furtherance of this step in the reduction of the enormous wastage of the country's resources, realizing that the abnormally high fire loss is a drain on the economical life of the country which affects all business interests."

A partial list of cities requiring the use of fire-resistive roofings within their respective limits is here given:

Allentown, Pa.; Augusta, Ga.; Birmingham, Ala.; Cambridge, Mass.; Charleston, S. C.; Chelsea, Mass.; Columbus, Ga.; Easton, Pa.; El Paso, Texas; Fall River, Mass.; Hoboken, N. J.; Jacksonville, Fla.; Lawrence, Mass.; Montgomery, Ala.; Newark, N. J.; New Orleans, La.; Norfolk, Va.; Paris, Texas; Paterson, N. J.; Perth Amboy, N. J.; Portsmouth, Va.; Reading, Pa.; Richmond, Va.; Savannah, Ga.; Salem, Mass.; Somerville, Mass.; Tampa, Fla.; Trenton, N. J., and Wilmington, Del.

Lacked Sprinklered Protection

On March 4th the Franklin School building at Minneapolis was destroyed by fire. Happened at a time when school was not in session. The building had 19 classrooms and accommodated 700 children. Three days before the fire the building was condemned by the Parents' and Teachers' Association; their report showed that the school lacked fire-escapes and a sprinkling system; that the fuel rooms were too close together, and that there was a wooden roof over the boiler room.—*Fire Marshal S. E. Crane, of South Dakota.*

Accepts Principles of N. F. P. A.

The committee on fireproof materials of the American Society of Testing Materials has accepted the principles adopted by the National Fire Protective Association in recognizing three grades of fireproof construction, i. e., full, partial and temporary.

This classification is in accord with that adopted some years ago by the International Fire Prevention Congress, attended by representatives from twenty-six nations.

Would More Equitably Distribute the Fire Loss Cost

ONE of the most important recommendations offered by President E. W. Richards, of the National Board of Fire Underwriters, at the recently held annual gathering of that body in New York City, was the appointment of a special committee of experts to study conditions in a number of States of the country that year after year show an excessive fire loss, and to suggest measures that will remedy the situation.

In dealing with this important question, President Richards said, in part:

"In certain States where year after year losses and expenses exceed the premium income derived therein the companies are confronted with a serious situation.

"Anti-compact laws and rate-controlling legislation in one form or another prevent the companies from readjusting their rates to a basis of fair profit so that such States will bear more nearly their just share of the national fire waste.

"What shall be done?

"The fire insurance companies cannot continue always doing an unprofitable business in those States, for other States, more fortunate as to losses and more just as to legislation, will not consent to always "holding the bag" for the persistently unprofitable ones.

"In the treatment of individual risks or plants, the companies have for years been doing an immense good by critical examination and advising their owners wherein the fire hazards could be reduced and the risks made better—such work being reinforced by schedule rating.

"The result has undoubtedly been one of great advantage, in which owners and insurers have shared.

"For the past twelve (12) years the National Board has furnished similar service to towns and cities by sending expert mechanical, hydraulic and building engineers to thoroughly examine (wholly at the cost of the companies) their fire departments, water supply systems and congested districts. The reports which have been made by these experts as to unfavorable conditions and improvements recommended have been found of great value to municipal authorities and the companies as well. Indeed their value would have been even more apparent if the companies had followed these reports more closely and taken warning from the serious faults thus pointed out, for millions of dollars would have been the resultant saving.

"These cities and towns are now to be graded by schedule and, presumably, with the eventual purpose of adjusting rates according to the conditions thus found.

"I would carry such service farther. We know that in some States the business of fire insurance is almost uniformly unprofitable. We know, or think we know, some of the causes that produce their excessive loss ratio, and we know also that in some States the expense of doing business is far in excess of the ratio of expense of other States. What more valuable service could we perform for the public and for our companies than to appoint an able committee of experts to make a thorough examination of conditions existing in each unprofitable State, a detailed report of same to be issued by the National Board, in which would be pointed out the reasons for excessive loss and expense ratios in such States?

"I would also grade by suitable schedule our forty-eight States, placing each State in its just rank as compared with the others, which would further tend to increased desire on the part of unprofitable States and States of low grading for betterments.

"Whatever the causes which have brought a State into an unprofitable condition, a thorough investigation and impartial report made by competent experts with a complete analysis of its disastrous record as relared to fire insurance, would, I am confident, have a profound and far-reaching influence, not alone upon the underwriter, but upon the people and the legislators of such a State.

"No more valuable publicity work could, in my judgment, be undertaken by the companies than in this direction. At least a half dozen of States hopelessly unprofitable, or nearly so, are in need of such investigation."

Other important reform measures urged by Mr. Richards was the preparation of a standard code of insurance laws to be "prepared under the direction of the committee on laws [of the National Board], which shall contain no reference to or recognition of the right of the State to control or regulate the rates to be charged for fire insurance."

Lighting, Heating and Engineering Standards

Prominent among the standing committees of the National Board is that dealing with "Lighting, Heating and Engineering Standards," the authorities of which during the past year are set forth in part in the subjoined report:

"In our report of a year ago, reference was made to the various pamphlets of suggested regulations and the revision contemplated in a large number of them. We had submitted during the year by the National Fire Protection Association, with recommendations for adoption by the board, a revision of thirteen different pamphlets, including the National Electric Code, which is revised every two years:

"Blowers Systems.

"Containers for Hazardous Liquids.

"National Electrical Code.

"Municipal Fire Alarm Systems.

"Hose Couplings and Hydrant Fittings.

"Internal Combustion Engines and Coal Gas Producers.

"Nitro-Cellulose Motion Picture Films.

"Pumps—Centrifugal—Rotary—Electric.

"Pumps—Steam.

"Sprinkler Equipments.

"Tanks—Gravity and Pressure.

"Vaults.

"Protection of Openings in Walls and Partitions Against Fire.

"A total of 343,200 copies of these and other pamphlets was printed and distributed at a printing cost of $7,149—a striking evidence of the fire prevention data which is supplied freely by the board to educate the public in improved equipment of buildings of every character and occupancy, and to lessen the hazard to life and property by fire. The recognition accorded these regulations is most gratifying. They represent the best thought of the technical experts in the insurance profession and of others interested. They are not mandatory, but are recommendatory only. The subject of construction is referred to only where suggestions respecting construction and installation are so interwoven as to require general statements of construction to adequately present regulations necessary to provide proper installation. The Underwriters' Laboratories, Inc., afford the opportunity to determine the best methods of construction, and are preparing and furnishing to those interested standard specifications covering the construction of various devices.

"The Underwriters' Laboratories, Inc., is an institution which has a nation-wide reputation. Our interest in the Laboratories in money value and in the work which it performs is of large proportions. We have contributed yearly to the erection and equipment of its plant and are justified in our feeling of pride in the position the laboratories hold as an investigator and judge of the merits and demerits of appliances in respect to the fire hazard. The report of its board of directors, appended hereto, is commended to our members.

"While your committee hesitated to concur in the request for a continuance of the appropriation of $20,000 which has been made to the laboratories, it does not raise the question of a reduction this year to the amount voted previous to 1914—$15,000—because of the commitments made to provide additional equipment at the Chicago and New York stations."

$172,000,000 IN PROPERTY VALUES DESTROYED IN 1915

According to the records of the National Board, "the total fire loss in the United States in 1915 approxmates $175,000,000, the lowest amount since 1905."

The annual loss of the country for each of the ten years, prior to 1915, was as here given:

1905	$165,221,650	1910	214,003,300
1906	518,611,800	1911	217,004,575
1907	215,084,709	1912	206,438,900
1908	217,885,850	1913	203,763,550
1909	188,705,150	1914	221,439,350

Cities in which the fire loss exceeded $5.00 per capita last year were as here recorded:

Newport News, Va.	$28.00	Danville, Ill.	6.86
Clinton, Ia.	12.46	Joliet, Ill.	6.83
Augusto, Ga.	11.87	Galveston, Tex.	6.52
Raleigh, N. C.	10.37	Springfield, Ill.	6.47
Key West, Fla.	9.41	Fresno, Cal.	6.24
Lockport, N. Y.	9.31	Port Huron, Mich.	6.06
Muncie, Ind.	9.16	Salem, Mass.	5.85
Davenport, Ia.	8.80	Muskegon, Mich.	5.57
Trenton, N. J.	8.11	Williamsport, Pa.	5.48
Erie, Pa.	7.78	Dubuque, Ia.	5.35
Shreveport, La.	7.64	Burlington, Ia.	5.14
Wilkinsburg, Pa.	7.50	Oswego, N. Y.	5.14
Montgomery, Ala.	6.94		

Pay Heavily for Their Folly

In reciting to "The American City" the lessons taught by the Paris, Texas, conflagration, and the manner in which they had been applied, E. H. McCuistion, mayor of the fire-swept city, said in part:

"Immediately after the fire the City Council met and passed an ordinance which forbids the use of wood shingle material on any structure hereafter to be erected, and permits old roofs to be repaired only to the extent of 25 per cent. Six years ago just such an ordinance was passed, but the people generally complained so loudly, persistently and bitterly that the Council found themselves confronted with the predicament of either repealing the ordinance or leaving town, because life was intolerable at home among their constituents. It is needless to say it was repealed, and the penalty—a heavier, galling, burdensome one—is now being paid.

"Perhaps no fire anywhere has ever more strikingly demonstrated the danger which must always attend the use of the wood shingles. In sections of the town where residences were not so congested as to ignite by intense heat or close proximity, there are standing here and there lone houses covered with non-combusible roofs upon which the shower of falling sparks had no effect, while every house in all directions from these were entirely consumed."

'Types of Buildings Burned at Augusta

READERS of CONSTRVCTION will be escpecially interested in learning of the types of buildings destroyed in the sweeping conflagration at Augusta, Ga., on March 22d last, the property loss of which aggregated $4,250,000, according to the most recent carefully compiled estimates.

From the special report on the conflagration made jointly by the engineers of the South-Eastern Underwriters Association and the National Board of Fire Underwriters we quote as follows:

"The Dyer Building, in which the fire originated, was built in 1890 at a cost of $60,000. It was five stories high with basement, 77x163 feet; area 12,551 square feet; walls brick, 8, 12, 16, 20 and 24 inches; exterior openings on all sides unprotected; light wood; ordinary joisted construction; elevator shaft, 7x15 feet with frame metal-clad pent house, and stairway, 4x12 feet nearly, neither enclosed; two light shafts, 20x30 feet each, extended from second floor through roof, same enclosed with metal on wood studs with ordinary glass in wood frames communicating with offices and hallways on each floor, and ordinary thin glass skylights in wood frames at bottom and top of light shafts; wood and lath and plaster partitions with ordinary glass lights on all floors; floors in hallway covered with concrete which had caused settling of floor beams; composition roof. The entire building was subject to one fire, and it was recognized as a conflagration breeder, and by a number of citizens as a bad 'fire-trap.' Results have shown the accuracy of this estimate.

Construction of Other Buildings

"To the west of the Dyer Building, the Richards Stationery Company building, was a three-story brick building in front; one story in rear, with rear wall of three-story portion of frame metal-clad construction above second floor. The restaurant was a three-story brick building connected with the Dyer Building by a one-story frame, part shingle roof shed, with unprotected windows in exposed wall directly over. The Merchants Bank was a two-story brick building with blank wall on exposed side, but had a wood skylight, glazed with thin glass, projecting above the roof.

Across Eighth street, 65 feet wide, was located the Union Savings Bank Building, 38x210 feet, fronting 210 feet on Eighth street, all under one roof and with unprotected openings on all sides. In the remainder of this block the construction, as a whole, was poor; being mainly ordinary frosted brick without fire walls, with low parapets, exposed exterior openings unprotected, and with numerous frame buildings in rear and frame appendages extending above roof, which formed communicators easily conveying fire from building to building; although there were four fire-proof buildings in this block, two of these, the Empire Life Building and the Augusta Chronicle Building had plain glass windows in wood frames and were not of as much practical assistance as a firebreak as they would have been if wall openings had been properly protected. The Citizens and Southern Bank, a two-story fireproof building, with blank walls on exposed side, served as an effective fire stop and enabled the fire department to save not only the adjoining buildings to the southeast in this block, but at least half of the buildings in the next block.

"Between Sixth and Eighth streets, along Reynolds, were located a number of brick cotton warehouses, but there was a sufficient proportion of frame buildings in rear, and back of good fire walls, together with large quantities of cotton in streets, to prevent firemen from stopping the fires with the apparatus available.

"Below Fifth street, on south side of Broad street, frame dwellings predominated, the majority of which had shingle roofs, and although Broad street is 165 feet wide, and Greene street, two blocks south of Broad, is 162 feet wide, either of which should have formed a good fire-break, sparks and burning brands fell on shingle roofs, ignited the buildings and swept southeast to the city limits, the fire department being overtaxed and powerless to prevent its spread.

"The underlying conditions that made such a conflagration possible are to a large extent present in all of the remaining blocks of the congested districts, and are very pronounced in three of the blocks.

Refused to Heed Warnings

"Very little attention has been heretofore given to fire prevention, either in the construction of buildings or the prevention of fires, and a recent attempt to create interest in these matters by the Georgia Fire Prevention Society was given a cold reception by citizens and city officials alike. The city had formerly had an anti-shingle roof ordinance, but this was repealed after about two years and shingle roof limits cut down to a comparatively small area, and just a few weeks before the fire the area in which shingle roofs were prohibited was further reduced. Enforcement of any of the laws has not been evident for many years, although conditions are better in this respect at present.

"The underlying conditions of poor construction which made such a catastrophe possible are generally present to a large extent in the remaining parts of the mercantile and dwelling districts and are considerably more pronounced in some sections of the city which were not destroyed.

Rebuilding to be Along Modern Ideas

"The burned district will be rebuilt along modern ideas. On March 27 a committee, consisting of Director of Public Works Nesbit Wingfield, Chief of Fire Department Frank G. Reynolds, Building Inspector W. B. Brown, City Attorney I. S. Peebles; G. Lloyd Preacher, representing the local architects, and H. H. Stafford, representing the Builders' Association, working in conjunction with the underwriters' engineers making this report, reported favorably on the adoption of the building code of the National Board of Fire Underwriters. On April 5 this code was adopted practically verbatim, with fire limits bounded by Fourth, Greene, Fifth, Walker, Sixth, Fenwick, Thirteenth, Third level canal, Fourteenth, Jones and Thirteenth streets, and shingle roofs prohibited throughout the city.

"The fire department will be improved, the city having since the fire authorized the purchase of two automobile pumping engines, one of 900 gallons and one of 750 gallons capacity.

"The matter of installing meters, making possible an increase of pressure on water mains, of strengthening the distribution systems by laying an additional 24-inch main from the clear water basin and of installing other needed mains in the city, has received the approval of the proper committee of council, and it is promised that definite action will be taken by council as soon as the necessary plans can be drawn up and proper financial arrangemnts made, probably about May 1. On April 5 the city authorized the borrowing of $500,000 to meet other obligations and provide in part for these improvements.

Bridgeport Merchants Interested

"Fire Prevention" and how it could best be attained in their city formed the chief subject discussed at the May meeting of the Bridgeport (Conn.) Business Men's Association. The extent of the country's annual fire waste and the imperative need for reducing it, primarily through the erection of a superior type of buildings and the exercise of care in keeping their premises clear of rubbish, was emphasized by prominent speakers, whose assertions and recommendations were endorsed by the business men.

Detroit, Mich., is to have a twenty-five story apartment house, plans therefor having been drawn by Leyen & Schilling. The structure, which will cost about $2,000,000, will be of steel, concrete and terra cotta construction. It will contain 250 suites of three and four rooms each, and 2,500 single rooms with bath. The three topmost floors will be utilized as playgrounds for children.

Fire-Swept Bangor Rebuilt

April 30 marked the fifth anniversary of the conflagration, which wiped out a large section of the business and residential districts of Bangor, Maine, the aggregate loss being over $3,000,000. Since the fire the burned area has been largely rebuilt, and with a more substantial, if not so historical, class of structures, the individual valuation of the new properties over those destroyed ranging from 50 to 200 per cent. In the opinion of the municipal authorities, a repetition of the 1911 disaster is highly improbable, because of the extension of the fire zone and the enactment of stringent building laws, forbidding the use of wooden shingles in the city, and the sharp restriction of wooden structures of any kind. The lesson of five years ago was an expensive one, but apparently it has been well learned by the citizens of Bangor.

A million dollars will be spent in the erection of a twelve-story addition to the Adolphus Hotel, at Dallas, Texas, of which Lang & Witchell are the architects.

Since the sweeping conflagration of March 22d Building Supervisor James H. Yeaman, of Nashville, Tenn., has inspected closely many of the ruins in the burned area. He says he has "not found a single chimney or flue that should be permitted to stand, and that the utilization of these chimneys in reconstruction work will not be allowed. Two or three months before the conflagration the building inspection department inaugurated a campaign to secure the removal of buildings regarded as dangerous, and particularly the demolition or proper reconstruction of chimneys or flues as were likely to cause fire. Since the conflagration the campaign inspection has been prosecuted with increased energy, and over two hundred chimneys and flues have been condemned.

"The chimneys condemned have by no means been confined to the old type of houses, many of recent and pretentious construction having fallen under the ban of the supervisor."

To insure improvement in this important connection in future a new order of the Building Supervisor reads:

"Every owner, agent or principal, contractor or person properly entitled thereto, shall demand of and receive from the brick layer erecting, remodeling or repairing any chimney or flue in any building or structure, a certificate from the supervisor that such work complies with the building laws of the city of Nashville, and the said brick layer shall furnish the said certificate to the said party as aforesaid previous to settlement for work done."

A 28-apartment brick block, four stories high, will soon be eretced on Windsor avenue, Hartford, Conn., by Joseph Bunce. The cost is placed at $75,000.

Fire Hazard of Municipalities

AMONG other useful activities of the National Board of Fire Underwriters, and from which property owners generally are benefited to a far larger degree than are the underwriters, is the determining of the fire hazard of the various cities of the country. For this highly important work the Board, at an annual cost of about $70,000, maintains a field staff of efficient hydraulic, electric and structural engineers, whose labors are supplemented by specially trained head office employees.

In reciting the activities of the engineering staff during 1915, the committee on fire prevention of the National Board reported that:

"During the past year there have been issued 24 complete reports on cities, as noted in the following list, in addition to 11 special and supplementary reports:

Malden, Mass.
Pittsburgh, Pa.
Cincinnati, Ohio.
Peoria, Ill.
Erie, Pa.
Decatur, Ill.
Rockford, Ill.
Fall River, Mass.
Manchester, N. H.
Portsmouth, Va.
Springfield, Ill.
New Bedford, Mass.
Brockton, Mass.
Cedar Rapids, Ia.
Roanoke, Va.
Des Moines, Ia.
Green Bay, Wis.
Nashville, Tenn.
Huntington, W. Va.
Binghamton, N. Y.
Elizabeth, N. J.
Oklahoma City, Okla.
Baltimore, Md.
Muskogee, Okla.

"Investigations have been made of various features of the water supply systems in Cincinnati and Dayton, Ohio, Pittsburgh and Scranton, Pa., and Poughkeepsie and Glens Falls, N. Y.; of fire department maintenance or operation in Cincinnati and Dayton, Ohio; Newark, N. J., and Salem, Mass.; of fire alarm systems in Philadelphia, Pa.; Providence, R. I.; Hartford, Conn.; New Bedford and Holyoke, Mass., and Superior, Wis.; of high pressure fire systems in Boston, Mass., and Atlantic City, N. J., and of the fire limits in Pittsburgh, Pa. In most of these instances, advice was sought by city officials as to the desirability of proposed new installations or changes in old systems.

"There have been issued also bulletins on 42 different cities which have been visited by Mr. Howland. This plan of personally discussing with city officials and civic organizations the findings and recommendations of the complete reports was begun about two years ago; its effectiveness is indicated not only by the results described in the bulletins, but also by the increase in the number of requests from city executives for criticisms and suggestions on proposed improvements to fire protection facilties.

"Special work on subjects along fire prevention lines has continued to increase in volume, which may be taken as evidence of the appreciation by members of the National Board and city officials to the ability of our engineers to render effective and welcome service.

"Assistance was rendered the City of New York by detailing an engineer to act during a period of nearly three months as special examiner for the Civil Service Commission in the practical examination for promotion to the position of Engineer of Steamer in the Fire Department. Another engineer assisted in the civil service examination for the position of deputy chief of the Fire Prevention Bureau. Investigations have been made and reports submitted at the request of members on proposed changes of location of fire department companies in New York.

"For much of the time since October, Mr. Raymond has been engaged, on behalf of the New York Board of Fire Underwriters, at its expense, in reviewing the plans and specifications for the proposed new fire alarm system in Manhattan, and in discussing proposed modifications with the Bureau of Fire Alarm Telegraph. Critical studies have been made of the various features involved, and the experience on other systems presenting similar problems has been analyzed; it has been possible in a number of instances to present suggestions which will undoubtedly result in improved service as well as economies in installation, and which will serve, we think, as a standard for use in other large cities. It is expected that the services of our engineer will be required on this work and in supervising the installation of the system for at least another year.

"Tests of motor fire engines at the Cincinnati Convention of the International Association of Fire Engineers were conducted by our engineers, at the request of the Association. Acceptance tests of 21 motor engines in 14 different cities were made at the invitation of city officials; a number of these were purchased on specifications conforming to those suggested by us.

"Our engineers have served as chairmen or members of various committees of the National Fire Protection Association and the International Association of Fire Engineers, and a number of addresses have been delivered by them to different organizations when this could be done without interfering with their regular duties.

"Mention has previously been made of the special reports on the conflagrations in Augusta, Ga., and Paris, Tex. Our engineers, Messrs. Hutson and Gold-smith, visited these cities directly after the fires, and were thus in a position to offer suggestions for the prevention of similar occurrences in the future. Mr. Hutson especially was able to exert a strong influence in securing the adoption in Augusta of the National Board Building Code and the authorization of improvements to the water supply system and fire department equipment. The National Board Code was also adopted in Paris within a few days after the conflagration.

"The Proposed Standard Schedule for Grading Cities and Towns of the United States, prepared by our engineers, was issued in December, copies being distributed to members of this Board and to insurance departments and rating and bureau organizations. The comments thus far received from these organizations have been very favorable. One party of four engineers has been engaged during the greater part of the year in making test applications of the Schedule to cities and towns of all sizes and in different parts of the country, as authorized by your Executive Committee. The results have indicated the entire practicability of the Schedule; some modifications are contemplated, as a result of the study made during the test applications, and suggestions received and anticipated from various insurance organizations, all of which will receive careful consideration.

"The appropriation for the past year was $68,000.

"Of the total expenses for the fiscal year of $69,714.31, the sums of $611.00 and $768.00 represent special services rendered the New York Civil Service Commission and the New York Board of Fire Underwriters, for which we have been reimbursed, and the sum of $1,000.00 is for a payment to the Westchester Fire Insurance Company, specially authorized by your Executive Committee, on account of which a special appropriation has been made from the General Fund."

Houston Seeks Lower Rates

Asserting that the 1915 loss ratio of Houston, Texas, justifies a 15 per cent reduction in present fire insurance rates, Commissioner Halverson, of the city, is agitating to that end. That the request will be granted is highly improbable, insurance rates being predicated, not upon the experience of a single centre or a limited period, but upon the average loss of a State through a series of years. In March, the city of Paris suffered a $15,000,000 conflagration, and if the logic of Mr. Halverson were to be followed that city would be forced in 1917 to pay for the loss of the present year; a proposition that violates the fundamental principle of underwriting and which no sane man would seriously advance.

Utah's School Building Code

Under the present rules of the School Buildings Commission of Utah, three types of school structures are provided for, namely:

"First: Fireproof buildings, of which two types are recognized, to-wit: (a) Absolutely fireproof, built entirely of incombustible and waterproof material, and (b) fireproof, built of incombustible and waterproof material, except that finished floors, frames, doors, windows and the usual trim of rooms are of ordinary wood construction with no open-air spaces behind wood.

"Second: Semi-fireproof or composite buildings, having enclosed walls, roof covering and interior walls, halls and stairs of incombustible materials; joists, girders and roof construction to be ordinary wood construction.

"Third: Non-fireproof buildings, with enclosing walls either of combustible or incombustible materials, and in other respects of ordinary frame construction."

It is required that all four-story buildings be fireproof. Two and three-story structures should be semi-fireproof, while one-story buildings only may be of non-fireproof construction.

"In all buildings in which the heating plant and the fuel storage room are below the main floor, or in the basement adjacent thereto, the walls, ceiling and floor of such rooms must be of incombustible material. Doors and frames to these rooms must be metal or have metal covering.

Lumbermen at Cleveland Excited

Determined opposition is being waged by the lumbermen of Cleveland, Ohio, to the proposed extension of the fire limits in that city. They assert that the dwelling section, which it is intended to embrace in the suggested safety measure, is the best present market for their product, and if their activities in this direction for prohibited, the only use there will be for lumber will be for kindling purposes and the making of matches.

Profit Through Hazard Reduction

Insurance inspectors have been going through Atlantic City, N. J., properties for some weeks past and have issued new rates upon the majority of them. The revised figures, for the most part, show substantial reduction over those formerly charged, and were granted because of improved risk conditions. A notable case is the Garden Pier property, upon which a marked concession in rate was allowed, mainly because of the erection of a brick structure across from the pier in place of the wooden Hotel Rudolf.

The Editor's Page

IN the busy hours of every day
We pause—
To analyze and weigh
A striking word, or deed, or
thought.

Construction of Dwellings

NOT the least important of the many services performed by the National Board of Fire Underwriters in the interest of the general public is the recent issuance of a brochure entitled "Dwelling Homes, a Code of Suggestions for Construction and Fire Protection." Designed to "safeguard homes and lives against the ravages of fire," the pamphlet was prepared by the National Board in response to many suggestions for such information.

The foreword of the publication states in part:

"The majority of dwellings are outside the control of building ordinances, and those within the jurisdiction of such laws usually have but few restrictions; hence the field for use of this information is broad.

"The few specifications governing dwelling-house construction in a Building Code are usually so scattered through the ordinance it is difficult for a person unfamiliar with such laws to ascertain exactly what is required. That fact further justifies codification of these well established principles for the protection of such structures.

"The pamphlet is distinctly educational in character, since, naturally, there is no authority to enforce its provisions. Many of the more important suggestions were extracted bodily from our Recommended Building Code, and still retain the imperative form of expression, 'shall,' as indicating, in our opinion, the strict necessity for the requirements. Although other parts may be expressed less positively, it should not be inferred that they are unimportant."

Under separate headings the work deals with such related subjects as "General Discussion of Defective Construction in Dwellings, and its Relation to Their Fire Hazard;" "Quality of Materials Suitable for Construction Work;" "Walls;" "Floor and Roof Construction;" "Major Structural Requirements to Protect Life and Prevent Spread of Fire;" "Chimneys, Flues, Smokepipes and Fireplaces;" "Heating and Lighting Equipment;" "Fire-Stopping;" "Frame Dwellings;" "Concrete Construction;" "General Precautions for Fire Protection."

So long as frame houses are erected or wood used in the constructin of brick or concrete structures, just so long and in proportion to the extent of their use will danger from fire exist.

In recognition of this fact, and not because the use of frame dwellings is favored, attention is devoted by the authors of the pamphlet to wooden structures, and particular pains taken to point out means whereby the fire danger in such connection can be reduced.

Primary credit for the preparation of the work must be awarded Professor Ira H. Woolson, consulting engineer of the National Board, and one of the country's foremost authorities upon safe building practice.

Elsewhere in the pages of this issue of CONSTRVCTION liberal extracts from the suggested Code appear, and further quotations will be given in our July number.

Grading Building Construction

In the future designing of residential properties architects will do well to bear in mind the fact that "underwriters are considering plans for a scientific classification of cities according to their fire hazard and a grading of buildings, based upon their location and construction." In other words, the insurance men are going to differentiate sharply hereafter against the home built for convenience and artistic effect merely and that in which the fire hazard is taken into account as well, and means for safeguarding it against such danger adopted.

It is wholly possible to build a home at the present time that shall be both artistic and secure against fire and kindred peril, and the house of the future must be of such character.

Large Increase in Fire Loss

In the five months ended May 31, 1916, the fire loss in the United States and Canada amounted to $113,528,920, as compared with $81,497,050 suffered in like period last year.

These impressive figures should arouse property-owners and municipal authorities to the seriousness of the fire waste and induce a type of building construction that will materially reduce it.

Two Buildings Burned Each Minute

BUT four hours and forty-five minutes elapsed from the start of the sweeping confligration at Nashville, Tenn., on March 22d last, until the last burning building was under control. Within that brief period, according to the comprehensive report of the disaster recently put forth by the Tennessee Inspection Bureau, a section of the city, two and a quarter miles in length and with an average width of 1,250 feet, was completely destroyed; 648 buildings, valued at $1,450,000, being wiped out of existence. Classified, the burned buildings were as follows: Frame with shingle roofs, 159; frame with fire resisting roofs, 160; brick with shingle roof, 1; brick with fire-resisting roofs, 79; frame stables, garages and outhouses, 229.

Reciting the progress of the fire, the report says in part: "Shortly after the fire started, 33 frame dwellings, located from 100 to 1,000 feet southeast of the planing mill, were on fire; of this number 18 were covered with shingle roofs. It is here that the hazard of shingle roofs is more forcibly illustrated than ever before.

"About 12:20 the firemen succeeded in controlling the fire in the 33 buildings, located in the first zone. but due to the increased velocity of the wind, burning shingles were carried across an 1,800 foot clear space and ignited other shingle roof buildings on Main and Howerton streets, resulting in a second conflagration in the more thickly populated and high valued residence section of East Nashville. At the beginning of the second conflagration a general alarm was turned in, and for the first time in the history of the paid fire department of Nashville every piece of available apparatus and the entire force of 120 firemen were brought into action.

"After the fire started in the second zone on Howerton and Main streets, it was difficult to determine the exact course it might follow. The origin of the fire in the second zone was due to shingle roofed buildings in both zones, though the spread of the fire cannot be attributed entirely to that of exposure of one building to another, as the freaks of the wind carried the fire around frame buildings and ignited brick building beyond. Several cases were noted where frame buildings were not damaged, and brick buildings less than five feet away were destroyed.

"Two important factors largely contributed to the rapidity of combustion were: First, the exceedingly high velocity of the wind; second, light type of frame construction with open foundations. This class of buildings predominated at the locality of origin of both zones of combustion, and with their shingle roofs, light 2x4 inch stud walls became easy prey to the flames.

"The open foundations of the frame structures permitted burning embers to be blown beneath the houses, while the shingle roofs readily ignited under the intense heat blown before the high wind.

"The majority of the streets in the burned districts are 50 feet in width, while one street is 100 feet wide. At points of advantage of this kind the fire department made a combined stand to stop the flames, but the high velocity of the wind converted large nozzle streams into spray. In certain portions of the fire zone the intensity of the heat was so great that many buildings were seen to burst into flames all over at practically the same instant. Burning grass was also responsible for many buildings igniting, both in and out of the fire zone.

"The rapidity with which the fire burned perhaps establishes a record for the destruction of dwellings property by fire, considering the number of buildings consumed in the relatively short space of time. *The fire traveled at the rate of 42 feet per minute, and destroyed more than two buildings each minute.*"

Chief Lesson Taught by the Conflagration

In the minds of the Bureau engineers, the "chief lesson taught by this conflagration is that if sweeping fires in American cities are to be avoided the hazards which invite them must be eliminated or minimized.

"Light frame construction, and especially shingle roofs, were undoubtedly responsible for fire starting in the second zone. If the hazards of quick burning construction are to be minimized in cities and towns the power lies solely in the hands of those who have legislative control of the common welfare and safety, and public sentiment should stamp with everlasting approval the legal abolition of the shingle roof and encourage only that type of construction which resists fire as well as time."

The Handy Fire Extinguisher

"It is estimated that 5,000 people lost their lives by fire in the United States in 1915," says Fire Marshal S. E. Crane, of South Dakota. "Nine out of every ten of these lives might have been saved if people would only take reasonable precautions to guard against fire. A small fire extinguisher is not expensive; it takes up little room and is always on the job. Pails are generally carried off to scrub floors and wash windows, but an extinguisher stays 'put,' and is always ready when needed."

Tabulating Fire Loss Statistics

Plan of Underwriters for Ascertaining Hazards of Structures and Businesses

TWELVE months ago the National Board of Fire Underwriters in an effort to intelligently ascertain the fire loss of the country, both in the aggregate and as related to localities, buildings and their contents, inaugurated an elaborate plan for the collection and tabulation of such data.

How the work has progressed thus far, and the intent of its sponsors for its extension during the present year, may be learned from the following quotations taken from the newly issued report of the Actuarial Committee:

During 1915 about 650,000 loss reports were received. The Bureau has received 246,355 reports on losses paid between January 1 and May 1, 1916, and if the present rate continues through this calendar year, the Bureau will have had filed with it over a million reports of losses sustained and paid by its members.

The difficulties encountered by the Bureau during the first year with the card unit system of reporting led your Committee to consider other forms for this use, and after considerable thought and discussion it was decided to adopt a form to be filled in mainly by the adjuster. Many of the companies were using adjuster's loss reports which differed widely as to the information requested. The present form was designed to meet this demand and furnish the Bureau with a report in detail of each loss.

Inasmuch as this report will doubtless be read by many companies or their representatives not in attendance at this meeting, it seems well to mention briefly the method employed by the Bureau.

The Adjuster's Loss Report blanks are furnished in duplicate to companies and all adjustment bureaus and adjusters upon request. The plan adopted for their use is for the person making the adjustment to fill out the reports in duplicate, sending both copies to each company interested in the loss. The company provides the proper classification number, the claim number, and upon making payment, stamps the date on the form and sends one copy to the Actuarial Bureau, retaining the duplicate for their files. This form of reporting, while meeting some objection on the part of adjusters at first, seems now to be quite generally understood, as evidenced by the completeness with which the inquiries thereon are answered. It was difficult at first to reach all independent adjusters, and although companies instructed those adjusting for them how the work was to be handled, it was necessary to write numerous letters setting forth in detail that the loss report blank was to be filled out in duplicate by the adjusters, and reports in duplicate sent to the company and not to the Actuarial Bureau direct. The report form requests that copy of apportionment be attached to each Adjuster's Loss Report. In order to save the labor of this duplication when more than one company is interested, the adjusters are requested to send one copy of statement and apportionment to the Bureau direct, noting the fact on each of the Adjuster's Loss Reports sent to the companies that this course had been pursued. The adoption of this form has provided the Bureau with a much more complete story of the loss, and furthermore, provides the companies interested with a statement as to the claim.

The losses reported as paid during 1915 have been tabulated for each State by cause for each class, divided by construction and protection, but as many losses were not reported to the Bureau last year because it was a new undertaking, and for the greater reason that there were not as many companies cooperating then as at present, the Committee were of the opinion that the furnishing of last year's record to each company member for each State would not be of sufficient value to warrant incurring the large expense. A tabulation is, however, being prepared which will show the record of losses for the entire country classified by causes and construction.

It was a well recognized fact even in the first year's transactions that the Bureau had undertaken a task of large proportions the details of which, even to an unpracticed eye, were enormous. With an increase in the number of loss reports for the year 1916, to at least one million, and possibly more, to which will be added at the close of the year the writings of the companies, the problem before the Bureau will be a larger one than ever, yet with an office now well organized and its details well arranged, the working out of the plan will be found successful and, as we believe, satisfactory.

The combining and tabulating of the losses of its members upon their United States business which has been thus commenced is an undertaking staged upon a volume of business never before dreamed of in a single office, and even now the experimental stage cannot be said to have passed. The number of companies supporting the Actuarial Bureau has reached more nearly a maximum, and from now on the compilation of statistics will be of increasing value, because the volume, when combined with writings, will be sufficient to obtain true averages on most of the classes. It will undoubtedly be found that in all classes a one year's record will furnish an insufficient volume for practical use, and, therefore, the combined results for *several* years will be required for furnishing sound and reliable average loss costs. It must also be borne in mind by the companies supporting the Bureau that the value of the records produced will be enhanced in proportion to the fullness and correctness of their co-operation. We are hoping, therefore, that the time is not far distant when the loss reports of the Bureau will represent a practically complete loss record of the fire insurance companies doing business in the United States, and when that condition has been reached, and the writings are reported in such a manner as not only to represent that business, but in such form as to blend correctly with the losses, the statistics of the Bureau will then become of the greatest value to the fire underwriter.

The experience of the Bureau in its first year has shown a marked difference in judgment as to the classifying of hazards, and the process of education toward uniformity in the direction of classification, going on quietly and efficiently, has been of great value to the companies in uniformly assigning risks to the various classes.

Many cases have developed from loss reports made to the Bureau where companies have been taken advantage of, either through ignorance or dishonesty of the assured or the agent, or both, in the matter of adjustment. In addition, it has frequently been reported to the Bureau that losses have occurred and been paid which on further examination have indicated attempts to defraud, as no loss had occurred.

Following this report your committee presents a statement of a few of the many hundred irregularities which have been discovered in the course of the year in connection with loss reports, some of which were undoubted attempts at fraud, others the result of ignorance and a few due to carelessness.

As the number of loss reports and the experience of the Bureau employes increase, this collection of moral hazard claims and claimants will, without doubt, be greatly enlarged and furnish valuable data for the beginning of a Moral Hazard Department.

Your Committee has distinctly in view both the need and the value of such a department to the companies contributing to the Actuarial Bureau and believes the time is not far distant when such a department can be made to furnish to its members the most valuable information of this nature anywhere obtainable.

Prior to January, 1915, the companies were required to report their losses to sixteen different States on report blanks which differed in arrangement and in the information called for, but through the efforts of the Committee, with the co-operation of the Insurance Commissioners and Fire Marshals, the companies now report paid losses direct to only one State—Texas; and make preliminary reports of losses incurred to only one State—Indiana.

As to the manner in which writings should be reported by the members of the Bureau: a large amount of time, thought and discussion has been given by the Committee to the working out of a scientifically correct scheme, but the details have not as yet been completed to the satisfaction of the Committee. It is hoped, however, that the new Committee to be appointed by the incoming administration will be able to take up the matter where the present Committee has left it and carry that problem to a sound conclusion.

A word respecting the "Proposed Standard Schedule for Grading Cities and Towns in the United States with Reference to Their Fire Defenses and Physical Conditions": at the request of the Actuarial Bureau Committee, through the Executive Committee, the engineers of the Committee on Fire Prevention prepared the Schedule, which was carefully revised and then approved by this Committee. A copy was furnished each underwriting organization and a request made for suggestions concerning it. The Schedule was also experimentally applied to cities and towns of five thousand population and over in the State of Illinois in order to meet the request of the Superintendent of Insurance of that State, and the results of the application were furnished Superintendent Potts. At present the Proposed Schedule is being revised to remove slight inaccuracies found to exist, and when these have been taken care of by the Actuarial Bureau Committee the schedule will be presented to the Executive Committee for formal adoption as a National Board standard, and recommended for use by organization engaged in the work of classifying or grading cities and towns in the territory over which such associations may exercise jurisdiction. It has, however, been decided and seems most wise, that the engineers of our Committee on Fire Prevention should, as part of their survey work, grade all places of twenty thousand population and over, and for the following reasons, which were set forth in the report to and resolutions adopted by the Executive Committee at its meeting of June 24, 1915:

"It is the thought of the committee that the schedule should be applied to the larger cities by engineers of the National Board of Fire Underwriters for the following reasons: They are familiar with conditions in these cities by reason of their studies and investigations of the past ten years, and with the problems involved in applying the schedule because of their work in its preparation; also it is desirable that there shall be uniformity in the application of the schedule throughout the country, especially in the larger cities, where the problems involved are greater and where the results are more likely to be subjected to independent study and criticism. Furthermore, many of the insurance organizations having jurisdiction in the larger cities have no engineering staff to apply the schedule, and the work could be done more satisfactorily and economically by the National Board: therefore be it

Resolved, That it is the sense of the committee that the application of the schedule to cities having a population of twenty thousand or over shall be made by engineers of the National Board of Fire Underwriters, and with this expression of opinion the matter is referred to the Actuarial Bureau Committee with power."

The Schedule is based upon the plan of assigning to the various features of fire defenses and structural conditions points of deficiency, depending upon the extent of conditions in more than three hundred cities. It is believed to be logical, scientific and defensible.

The Committee has held its meetings frequently during the year and many have been very lengthy because of intricate and far-reaching problems to be considered. It has been recognized that the entire work has necessitated changes in company methods, but no one will gainsay that there is not a need for change in the methods that have been in vogue for many years and which some will readily conceive are obsolete and have been most expensive.

There are at present thirty-eight employes engaged in the work in connection with loss reports, including the editing and arranging of same, making and filing claimant cards, both by name and by location, copying loss reports for States whose laws require such procedure, and punching, sorting and tabulating loss report cards.

* *

Activity of Memphis Builders

One of the most intelligently active divisions of the Memphis, Tenn., Chamber of Commerce is the Building Trades Committee. Composed of dealers in building materials, the committee seeks to have "Memphis architects draw plans; Memphis contractors get jobs, and Memphis material dealers furnish supplies for all buildings in Memphis and the great Memphis territory." Last year "get-acquainted" visits were made by the Committee to Corinth, Marranna and Clarksdale, and so satisfactory were the results that it is intended to go farther afield during the present season. D. A. Gates is chairman of the committee.

Liable for Building, Materials

A recent decision by the Wisconsin Supreme Court is of peculiar interest to builders and building supply men.

On a private contract at Milwaukee the Court affirmed judgments in favor of material men against the Illinois Surety Company of Chicago, as surety on the contractor's bond, which was conditioned as follows:

"'The condition of this obligation is such that if the principal shall faithfully perform the contract on his part, and satisfy all claims and demands incurred for the same, and fully indemnify and save harmless the owner from all cost and damage which he may suffer by reason of failure so to do, and shall fully reimburse and repay the owner all outlay and expense which the owner may incur in making good any such default, then this obligation shall be null and void; otherwise it shall remain in full force and effect.' Concrete Steel Co. vs. Illinois Surety Co. 157 N. W. Rep. 543; Milwaukee Building Supply Co. vs. Illinois Surety Co. 157 N. W. Rep. 545 (advance sheets May 5, 1916).

"Following the decision of the California Supreme Court in W. P. Fuller & Co. vs. Alturas School District, 153 Pac. Rep. 743 (bulletin 2087 Feb. 1, 1916), this decision of the Wisconsin Supreme Court now sets the trend of authority squarely on the proposition that sureties are liable to a direct action by materialmen for the payment of contractor's indebtedness on both public and private contracts, whether the bond contains a specific promise in favor of materialmen or not. The uniform minimum of one per cent of the contract price now advised for all building construction, public and private, is therefore fully justified."

Radical Reform Needed in Texas

Municipal authorities throughout Texas have been strongly appealed to by State Fire Marshal S. W. Inglish to adopt new and stringent building ordinances with a view of safeguarding against the fire menace if they wish to escape a fate similar to that suffered recently by Paris, one of the thriving communities of the commonwealth. Marshal Inglish asserts that fire-breeding conditions in many of the cities and towns of Texas are deplorable, and he urges those in authority to adopt prompt remedial measures.

Mr. Inglish mentions especially the need for abolishing the dangerous wood shingle roof, and the adoption in its stead of incombustible material. He likewise points out the importance of having a thoroughly efficient fire alarm system, stating that "all fires are the same size in the beginning, but a difference of seconds in giving the alarm may mean a difference of thousands in the loss occasioned."

INTERIOR FIRE ALARM SYSTEMS

UNDER the revised ruling of the New York Industrial Commission fire alarm systems for industrial plants throughout the State are divided into three classes for buildings of defined heights. The number of employes in each class of buildings is limited by the rules.

The new rules say that systems shall be approved as follows: Class A, for installation in buildings not exceeding four stories in height, occupied by not more than one factory tenant, with not more than 100 persons employed above the ground floor; Class B, for installation in buildings not exceeding six stories in height, occupied by not more than one factory tenant, in which not more than 150 persons are employed above the ground floor, and Class C, for installation in all buildings not specified in Classes A and B (Class C system may be installed in any building). Where a building is divided by fire walls each section may, in the discretion of the supervising authority, be deemed a separate building for the purposes of these requirements.

The various systems shall comprise the following: Class A, whistles, bells, gongs or horns, mechanically or electrically, automatically or manually operated from all floors, and sufficient in number and size to be clearly audible to all occupants under conditions which prevail when the factory is in full operation. Where electrically operated the systems must conform to the requirements for Class B and C installation. Class B system shall include open circuit electric system with gongs or horns and sending stations on all floors, not necessarily sending coded rounds of signals. The methods of construction and the materials used shall be in accordance with the requirements for Class C systems, except as they apply to sending stations, gongs and supervisory apparatus, Class C system shall include systems employing boxes and signaling devices giving rounds of signals and operating entirely on closed circuits.

"Inflammable Building Material Should Be Barred"

("The Argus," Albany, N. Y.)

FIGURES showing the fire loss of the United States and Canada for the first four months of the year are far from encouraging. The total losses in that time aggregate $97,555,420. So much effort has been made to teach the people to take precautions against fire that it is astonishing to find that the losses for the first four months of the year reach that immense sum. One would naturally expect them to show a decrease from the corresponding figures of last year; but such is not the case. The losses in the United States and Canada for the first four months of 1915 were $70,108,600, while for the first four months of 1914 they were $88,162,456. The 1915 record showed a considerable improvement over 1914, but the improvement was not kept up.

Carelessness is perhaps the main cause for this heavy fire loss, but it is certain that much of it was due to the flimsy construction of so many buildings. There are few cities in the United States whose building regulations could not properly be revised. The employment of inflammable material in building construction should be more strictly regulated by law. This is especially true of buildings of large size in the business sections of cities. It is true that some of the factories and many of our warehouses are veritable fire-traps, not only in the former case endangering adjoining property, but human lives. It is only when a big fire ends in catastrophe that we awake to a realization of that fact, and then we proceed to forget it.

In all the important cities of the United States during the past few years large sums have been spent for improving the apparatus of the fire department, yet we find that the fire loss in the country and Canada for the first four months of the year is actually $26,000,000 greater than that for the corresponding period of last year. This is simply disgraceful. And one of the bad features of it is that such a loss involves a throwing out of employment of a considerable number of those employed in the factories that were destroyed. We do not take our growing loss seriously enough. We should set about reducing it by every possible means.

Cleaning Out Fire Traps

Under instructions from the State fire marshal repairs were made to no less than 102 buildings of various types throughout Ohio during one month. Of the buildings in question, 11 were dwellings; 13 were barns; 44 sheds, and 34 not specified. The Ohio fire marshal is alive to the fire menace of dilapidated structures, and is active and insistent in ferreting them out.

A large plant for the manufacture of acids is soon to be erected on the Newark, N. J., meadows by the Keystone Reduction Company of New York City. Of steel construction, 40 feet wide by 750 feet long, the new property will cost about $100,000.

During the year ended March 31, 1916, the fire loss of New Britain, Conn., aggregated $48,934.

Individual Responsibility for Fire

The cost of extinguishing fires due to indifference, carelessness and negligence should not be met by the people at large in a community. It is the owner or occupant who ignores city ordinances and fire prevention orders who should pay the cost of the run of the fire department to his premises, including time of the firemen and water used.

The Rochester Association of Credit Men proposes to deal a solar plexus blow in the fire-prevention campaign. The fire insurance committee of the credit men has under consideration an attempt to pass an ordinance in Rochester making individuals liable for fires due to their carelessness or neglect. Such a personal liability law has already been placed on several statute books as a result of agitation by the National Fire Prevention Association and the National Association of Credit Men.

In Cleveland failure to comply with an order of the Fire Commissioner to remedy conditions favorable for fire is punished by a fine. If a fire results from this non-compliance, the responsible person is liable for all costs and expenses of the fire department incurred in the extinguishment of the blaze.

Whether or not wholesale inspections were made under such an ordinance, the lever would be there to correct the flagrant cases of carelessness and neglect. The ordinance could be passed as an additnonal section of the public safety and good order laws, and the inspections could be made by firemen under the direction of the Commissioner of Public Safety.

Figures no longer stagger the American mind. Great wastes of human life and tremendous economic losses have so recurred during the last decade that ciphers have lost their impressive power. That over two hundred millions is destroyed by fire annually has been paraded and paraded before the people of this country. That a large percentage of the fires is due to callous indifference, gross carelessness and criminal negligence has been told and retold. The annual ash heap does not diminish; the cost of fire departments, waterworks and other fire-prevention means increases. It is high time to call a halt. This legislation which makes the careless property owner pay the bill for extinguishing a fire due to this neglect would eliminate many fire causes.

Here is simple proof that carelessness is a big factor in fire origins. A local agent jotted down at random the causes of a dozen recent fires which were reported to his office. They are: Hot ashes in wooden barrel, combustion in refuse, match thrown into waste paper basket, overheated furnace, unknown in clothes locker, cigarette dropped on bed, curtain blowing against lighted candle, barrel of waste, Christmas tree, defective wiring, cigar.

Conditions Bad Throughout Texas

S. W. Inglish, State Fire Marshal of Texas, is authority for the statement that "conditions over the State are very bad so far as fire hazards are concerned." Particularizing, Mr. Inglish said: "Imperfect wiring, improperly set flues, rubbish, old boxes and other hazards of similar nature cause us the chief concern, and while we have made much progress in getting these conditions cleaned up, we must keep after many cities constantly.

"In Galveston I find that 90 per cent of the fire hazards could be removed at small expense to the owners. Property owners do not appear to understand that their insurance charges would be greatly reduced with a little care, patience and cleanliness. Seventeen per cent of the fires that occur in Texas are flue fires that would never have occurred but for the carelessness of the owners."

Regarding the wood shingle room Marshall Inglish holds that the day will soon come when this dangerous form of roof covering will be prohibited in every community of any size in Texas.

He might have gone further and predicted its abolition in all enlightened centres throughout the entire country.

Building Inspection at Birmingham

Efficient work by the building inspection force of Birmingham, Ala., has very materially reduced the fire loss of the city, and together with the new building ordinances is enforcing the erection of a superior type of structures, both mercantile and residential.

The activities of the Inspection Department for the year ended May 1, 1916, are thus summarized by Chief Engineer Julian Kendrick:

"Since May 1, 1915, 5,553 building permits have been issued. They cover the rebuilding of approximately 4,250 flues and the re-covering of 2,683 shingle roofs with fireproof material. Sixty-seven notices for unsafe and defective conditions of buildings have been served and complied with.

"We have also served notices to trap or enclose the vertical openings in twenty-six buildings within the past month. These buildings are all three stories or more in height and are in the fire district. To see that the building laws are complied with, there have been made 19,567 general inspections. The condition of buildings in the city of Birmingham as regards fire hazards are 75 per cent safer than two years ago, owing to above rigid enforcement of the building laws."

Two lives, and property valued at $60,000, were lost through the burning of the Penn College at Oskaloosa, Iowa, early in May last. The fire started in the biological laboratory, and, it is believed, was due to defective electric wiring.

Brick Man Offers Sound Counsel

The following letter was sent to *The Clay Worker*. Written by one interested in brick, it naturally emphasizes that firesafe product, but the plea for "family peace," for sane co-operation in a united effort to offset the influence due to the activities of lumber sponsors, is so broad and properly applicable to *all* the industries related to fireproofing, that CONSTRVCTION is glad to present Mr. Hinde's constructive views. We have printed certain sentences by Mr. Hinde in italics. Wherever the words "brick," "burned clay," "brick maker" or "brick dealer" occur "firesafe materials" and "manufacturers of firesafe products" might well be understood:

"I am writing you briefly on the subject of creating a demand for brick for residence construction by the general building public.

"My judgment of several years past has been confirmed by my canvass of the crowds attending the Cleveland Building Show, which I did very thoroughly by advertising a $3,500 seven-room residence. *The home-building public are thirsting for knowledge of some material of a lasting and imperishable quality with which to build their homes. They are heartily sick and tired of the extravagant, heavy cost of upkeep incidental to all wood construction, but on account of the almost universal use of wood for house-building in the greater part of America, they know of nothing better to use.*

"Thousands of home-seekers expressed great surprise that I was offering to build a beautiful seven-room house so cheaply, and I am quite safe in saying that my modest exhibit attracted more real interest from the moderate-priced-home seeker than all of the grand artistic brick exhibits in the show, because I told them just what a completed house would cost and where they could see it already built and for sale at the above price.

"In fact, I think that the very elaborateness of many of the brick displays actually drove the man of modest means away from thinking of a brick home, because he felt that it was meant only for the wealthy, who have means to purchase works of art.

"It is high time that the brickmaker, and particularly the brick dealer, awake from their fifty years' Rip Van Winkle sleep and take advantage of the opportunity being thrown at their heads. *Hundreds of lumber dealers are sending out thousands of circulars daily, showing how beautiful frame houses can be built for a moderate cost, and this in face of the fact that lumber has steadily advanced at the rate of one dollar per thousand per year for the last forty years:* within the past six months it has gone up from three to five dollars—and still the brick man sleeps on.

"Now, I want to give the brick man one more word of counsel. Let the face brick man, the common brick man and the hollow tile man *stop their petty bickering among themselves and lend their united efforts to educating the general public* that a very beautiful home can be made at a very moderate cost, of the commonest kind of brick or tile, if burned of a hard quality, being laid up in artistic bond and well blended with suitable mortar colors.

"After the public has been taught that any hard-burned clay is everlasting and that clay can be mined in nearly every county in America, and is therefore inexhaustible, and that the price will never vary much from normal, they will then demand that their homes be built of burned clay.

"I am quite safe in saying that if the lumber men were to change places with the brick men, there would not be one frame house built where there are now ten."

"Endangers Life and Property"

The attitude of fire underwriters toward wooden shingles as a roof covering may be gleaned from the following reference to the subject, culled from the recent annual address of E. G. Richards, president of the National Board of Fire Underwriters:

"The use of wooden shingles should be prohibited everywhere except on buildings remote from business or dwelling centers. Better, even, would it be if their use for wood covering was everywhere forbidden by State law as a form of construction which endangers life and property."

Approves CONSTRVCTION'S Mission

In a recent letter to this office, W. Ward Watkin, a leading architect of Houston, Texas, says: "I note with interest the purpose of your publication, and its articles referring to the recent fires in Southern cities, and I wish to add my hearty support to the very useful campaign which your publication in placing before the public the very necessary statements of facts relating to the alarming extent to which fires can devastate the residence portions of cities where frame buildings predominate."

To Travers-Wood Company, of Richmond, Va., was awarded the contract for the erection of a seven-story fire-proof building to be erected at Gastonia, N. C., for the First National Bank of that city. The structure, which was designed by Wilson & Sompayree, Columbia, S. C., will be of steel frame with tile roof, and will cost about $150,000.

At a cost of $1,500,000 the American Exchange National Bank, of Dallas, Texas, will erect a sixteen-story office building, plans for which are being drawn by architects Lang and Mitchell, of Dallas, and Arthur C. Bossom of New York City. The structure is to be fire-proof and will have all modern conveniences.

Modernizing Baltimore's Code

THE committee named sometime ago to revise the building code of Baltimore, Md., has since been steadily at work, and, it is expected, will complete its labors about August 15, or shortly thereafter.

Reviewing the present building laws of the city, the experts of the National Board of Fire Underwriters say:

"The municipal building code was enacted July 6, 1908. Several minor amendments have been made since that time. Special privilege ordinances affecting heights and frame ordinances are not infrequent. The code requires fireproof construction for hotels, lodging houses, schools, theatres, hospitals or institutions for the care or treatment of persons; more than three stories or 45 feet in height; tenement or apartment houses more than five stories or 70 feet high, and all buildings more than 85 feet high. Specifications covering the fireprooing of structural metal are full and mainly good; steel roof construction over large rooms not used for the sale or storage of materials may be unprotected, and requirements of roof construction are otherwise somewhat deficient. Wood wearing floors are permitted, and wooden frame for partition doors and windows in buildings 100 feet or less in height; in buildings over this height interior finish must be metal or metal covered.

Mill Construction

"Requirements for slow-burning or mill constructed buildings are deficient, and no buildings are required to be of this type; protection of structural metal is inadequate and window and floor openings and fire protection are not required.

"Frame buildings are limited to three stories in height, except church spires and belfries outside the fire limits. Height of other non-fireproof buildings limited according to specified occupancy, or to 85 feet as above. All construction is restricted to 175 feet in height, except towers, spires and belfries in fireproof buildings; this limit of height has been raised in several cases on the passage of special ordinances. Sheds must not exceed 2,500 square feet, but building areas not otherwise restricted.

Protection of Fire Windows and Shutters

"Fire windows are required in buildings over 100 feet high, except below the second story on street fronts. Ordinary masonry and slow-burning buildings more than two stories high, except hotels, tenements, dwellings, lodging houses, apartment houses, schools and other places of public assembly, must have opening exposed at a distance of less than 30 feet, or on a party line and above adjoining roofs, provided with fire shutters or fire windows. The inspector, with the approval of the mayor, may require or allow omission of window protection regardless of code. Complete protection to floor openings is not required; elevators need be in fireproof enclosure only when the building is fireproof or when built around by stairways; floor openings for elevators in buildings of wooden floor construction only require to be trapped. Requirements for protection to openings in fire walls and for skylights are good.

"There are a number of good requirements applying to frame construction in general.

"The requirements governing reinforced concrete are abbreviated and rather general and need revision in conformity with modern practice; requirements for tests of finished construction, competent and continual inspection and superintendence are lacking.

"Parapets are required to extend only ten inches above the roof and when not over two feet in height without cornice connection need be only nine inches thick. Cornices must be incombustible. Specifications for chimneys and heating apparatus are full and mainly good. Suitable fire stops are specified for frame buildings and furred walls.

Thickness of Walls

"The specified thickness of brick walls is mainly adequate and may be required to be increased in thickness, depending on the length and span between the walls of the dwelling house class, with limited span and length and not over two stories high, may be only nine inches in thickness. Provisions for floor beams are mainly good, but only four inches of masonry is required between the ends of beams entering a wall from opposite sides. Quality and strength of materials must be in accordance with comprehensive specifications and in part with recognized standards; materials and new or unusal methods of construction, which are safe and acceptable, may be used as the inspector approves.

Must Install Automatic Sprinklers

"Inside standpipes and hose are required in theatres and in new buildings over 85 feet in height; standpipes and other fire apparatus and appliances in existing buildings over 85 feet in height must be provided in accordance with regulations formulated by the inspector and approved by the mayor; automatic sprinklers are required in theatre stage sections and at the proscenium wall on the auditorium side.

"Provisions for egress are not in accordance with modern standards; smoke-proof towers are not required. Fire escapes of the stair and balcony type are permitted on new buildings. Except for the above, the provisions are fair; one stairway in warehouses and buildings over three stories high used for manufacturing must be in fireproof enclosure and outside fire escape must be provided on practically all buildings more than two stories high, except stores, and on any building as required by the inspector; stairway enclosed in fire walls may be substituted for fire escapes. Proper provisions are made for scuttles and stairway ladders.

Wood Shingle Roof Limits

"Throughout the city the roof of all frame and ordinary masonry buildings must be finished with incombustible materials; within the fire limits repairs to shingle roof are prohibited.

Fire Limits

"These cover about 14.8 square miles. The district includes nearly all of the closely built portion of the city, within which are the mercantile, manufacturing and warehouse sections and the compactly built residence sections; within this district frame construction is prohibited, except contractors' sheds.

Enforcement of Requirements

"The enforcement of the building laws appears to be good, judging from the buildings recently completed. The restriction of height of fireproof buildings has been removed on the passage of special ordinances in several specific cases. The erection of frame structures within the fire limits, more especially on wharf property, has also been permitted by special ordinance; before the inspector submits approval of these to the mayor and council, he obtains the report of the Board of Fire Commissioners, that such structures will not constitute a serious fire hazard."

Lynn Ordinance Likely io Stand

Lumber and allied interests, whose opposition to any and every measure that tends to safeguard against the fire peril can always be counted upon, have been waging a bitter but, happily, a losing fight at Lynn, Mass. Some months ago the council of this busy manufacturing centre passed an ordinance barring the use of the menacing wood shingle as a roof covering; the measure to become operating May 18th.

The lumbermen, incensed at the idea of losing city after city as a market for their product, put up a stiff fight, using the usual specious arguments in defense of the shingles that has been heard again and again in different parts of the country, but which always succumb to the acid test of truth.

A rehearing on the ordinance was held for the 31st, and it now looks as though the measure could stand.

Statement of Ownership, etc.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, of Constrvction, published monthly at New York, N. Y., for April 1, 1916.

State of New York, County of New York, ss.:

Before me, a Commissioner of Deeds in and for the State and county aforesaid, personally appeared George A. Watson, who, having been duly sworn according to law, deposes and says that he is the general manager of Constrvction, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publishers—Constrvction Publishing Co., Inc., 1475 Broadway, New York City.

Editor—C. Stanley Taylor, 1475 Broadway, New York City.

Managing Editor—C. Stanley Taylor, 1475 Broadway, New York City.

Business Managers—A. H. Eichholz and G. A. Watson, 1475 Broadway, New York City.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock): Construction Publishing Co., 1475 Broadway, New York; G. A. Watson, Cranford, N. J.; C. Stanley Taylor, 1475 Broadway, New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs, next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the Company, but also in cases where the stockholder or security holder appears upon the books of the Company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contains statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the Company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

GEORGE A. WATSON, General Manager.

Sworn to and subscribed before me this 3d day of April, 1916.

[Seal] William E. Werner.

(My commission expires October 20, 1916.)

Roof Protection at Huntsville

READING aright the severe lessons taught by recent conflagrations the Common Council of Huntsville, Ala., has fallen into line with the progressive communities barring the dangerous wood shingle roof. As adopted the ordinance reads:

"Requiring that the roof covering of all houses, buildings or other structures within the corporate limits of the City of Huntsville, Alabama, be covered with incombustible material; also requiring that roof coverings of all structures within said above named territory, when repaired, renewed or replaced, shall be repaired, renewed or replaced with the incombustible material.

"BE IT ORDAINED by the Board of Commissioners of the City of Huntsville, Alabama:

"1. THAT ON AND AFTER the first day of May, 1916, the outside roof covering of all houses, buildings, or other structures to be erected, located within the corporate limits of the City of Huntsville, Alabama, shall be of metal, slate, terra cotta, clay, tile, approved composition, or other incombustible materials, and it shall be and is hereby required under this ordinance, that no "composition roofing," except that which shall have been approved by the National Fire Underwriters Association, or some other Association of similar power, State or national, shall be used in roofing.

"IT SHALL BE unlawful after the above named date, for any person, firm or corporation, to renew, or replace the roof covering of any house, building or other structure within the aforenamed territorial limits with any wooden boards, shingles or like combustible material.

IT SHALL BE unlawful on and after May 1, 1916, for any person, firm or corporation, to repair, renew or to replace the roof of any house, building or other structure within the territorial area mentioned in Section 1 of this ordinance, with wooden boards, shingles or like combustible materials; but that on and after said date all materials used in repairing, renewing or replacing any roof, the covering to such houses, buildings or other structures, shall be metal, slate, terra cotta, clay, tile or other incombustible material: PROVIDED, however, that any house, building or other structure located in the above named area, may be repaired one time only with similar material to the old roof, where the area to be repaired, renewed or replaced does not exceed 25 per cent of the whole roof, unless the necessity to repair, renew or replace such roof was caused by fire or wind storm, in which event the area to be repaired, renewed, or replaced with like old roof shall not exceed 50 per cent of the area of the whole roof.

"3. THAT IF THE OWNER, agent, lessee or other person in charge of such house, building or other structure, now standing within the territorial limits mentioned in first section of this Ordinance, shall desire to renew, or replace the covering of the roof of such house, building or structure, with any covering other than tin, iron, slate, terra cotta, or tile, then such owner, agent, lessee or other person in charge of such house, building or structure, shall, before commencing said work of repairing, renewal or replacement, submit a sample of the material to be used for such covering, to the duly appointed Chief of the Fire Department, or the Commissioner of the Fire Department, and shall secure from him a written permit to use such materials as a covering for such roof; and it shall be unlawful to cover the roof of any building, or other structure located within the territorial limits mentioned in Section 1 of this Ordinance, with any material other than tin, iron, slate, tile, or terra cotta, without the permission and approval in writing of the said Chief of the Fire Department or Commissioner of the Fire Department of the City.

"4. THAT NOTHING IN this ordinance shall be construed to prevent the use of wooden rafters and sheathing to which the roof covering may be attached.

"5. ANY PERSON VIOLATING the provisions of this Ordinance, upon conviction thereof, shall be punished by a fine, not exceeding $100, or a sentence to work on the streets or other public works of the City of Huntsville, for a term not exceeding sixty days, either, or both, in the discretion of the Court."

Kansas City Falling Into Line

As chairman of a recently appointed special committee of the City Club and as a representative of the Kassas City (Mo.) chapter of the American Institute of Architects, M. Root, of Root & Siemers, leading architects, addressed the authorities of his city regarding the desirability of a change in the present building code, which is held to be antiquated.

The committee's report, which in all likelihood will be adopted, urges that the work of code revision be entrusted to a committee of three; the committee to be composed of: An architect who shall be chairman; an engineer and a representative fire underwriter.

Hard-Headed Fire Fighters

As against the labored efforts of the lumbermen to advance reasons for the rapid and widespread conflagrations at Nashville, Tenn.; Augusta, Ga., and Paris, Texas, it is interesting to read the clear-cut and emphatic statements of the fire marshals and local fire chiefs of the States and cities affected.

These latter statements appear elsewhere in this number of CONSTRVCTION.

Want Better Returns from Texas

Application for better rates from Texas has been made by the fire insurance companies to the Texas Fire Insurance Commission, and a hearing thereupon will be held on May 23d. The fire loss of the State, already heavy, was multiplied through the conflagration at Paris on March 22d.

The suggestion of the underwriters for securing the desired result was as here noted:

Change the term rule to collect two and a half premiums for a three-year policy and four premiums for a five-year policy. At present two and three-year premiums, respectively, are collected.

Increase rates on frame dwellings, barns and outhouses. Dwellings to take 10 cents increase and shingle roofs an increase of 10 cents, thus making a 20 cents advance on each $100 of insurance on frame dwellings with shingle roofs, besides the increase in the term rule.

To increase 33 1-3 per cent rates on the following classes: Brick mercantile buildings and contents, frame mercantile buildings and contents, asylums, bakeries and candy factories, brick and tile works, courthouses and city halls, cottonseed oil mills and products, flour and cereal mills, fuel oil tanks, terminal grain elevators and shirt factories, rice risks, sanitariums, sugar houses and refineries, stockyards, woodworks other than saw or planing.

The notice of hearing contains the following extract from the petition filed with the Insurance Commission:

"In justification of this petition we invite your attention to the attached statement of the record of all companies on the several classes named therein, compiled from the records in your department, and which is hereby made a part of this petition. This record shows that for five years past the insurance companies have paid in losses in Texas $669 out of every $1,000 received in premiums, to which must be added $365 paid for expenses in connection with the business, showing a loss to the companies above receipts of $34 on each $1,000 received. These figures do not include the amount necessary to maintain the legal reserve required by law, which materially increases the burden of the companies under past and prevailing conditions. The recent conflagration losses sustained by the companies at Paris, Houston and McKinney will materially affect the business for some time in the future, and prompt action on the part of the commission in carrying out the plain provisions of the law in promulgating adequate and reasonable rates is requisite and necessary to give relief to the companies to enable them to meet the requirements of the insuring public in furnishing sound and stable indemnity.

"We are confident that the financial and commercial interests of this State will, from the standpoint of self-interest and justice, be willing to admit and to grant to the fire insurance companies the legitimate right of a reasonable profit on their business. Five per cent underwriting profit is not unreasonable as compared with other lines of business, and an additional 10 per cent to maintain the necessary conflagration surplus is mandatory to enable the companies to give prompt and satisfactory relief when these catastrophes occur. To accomplish this it will be necessary that rates be advanced to such a figure as to reduce the loss ratio in this State to 50 per cent. The records in your department show that the average loss ratio for the last five years for all companies on all classes is 66.5 per cent, which is 16½ per cent in excess of the necessary 50 per cent. The loss ratio, therefore, is 33 1-3 per cent higher than it should be, which necessitates an advance in rates of 33 1-3 per cent to reduce it to the proper point. The average rate now obtained is $1.15."

The First Skyscraper

Credit for the first skyscraper built in this country is generally conceded to Chicago. It was built in the "loop district" of that city in 1886, from plans of Holabird & Roche. The first example of lofty building in New York City was the structure at 50 Broadway, designed by Bradford Lee Gilbert in 1888. A few years later both these wonders became insignificant and practically forgotten by succeeding skyscrapers. Both these were not the initial efforts, for a skyscraper was designed nearly three centuries ago, many generations before the discovery of the steel cage system of this day.

Jacques Perret, an architect of Chambery, Savoy, is the accredited author of plans for an eleven-story building, 361 feet in height, which must have had twice the space between floors, for to-day eleven stories are crowded within a height of 150 feet. Perret's building was planned to be 166 feet long and 140 feet wide, with supporting walls twelve feet thick at the base.

While never executed, the project of Perret in many ways was a remarkable prophetic vision. Evidently it was intended for dwelling purposes, for in describing the project he wrote: "This great and excellent edifice can accommodate comfortably 500 people."—New York Post.

The next issue of CONSTRVCTION *will contain an article on*

The Safe Construction of Glass Store Fronts

in which the advantages of the modern arcade front, as compared to the older types, will constitute a part of the discussion.

SAFE HOMES

A DEPARTMENT OF "CONSTRVCTION"

Devoted Exclusively to the Interest of the Home Builder

Edited by Ralph P. Stoddard

The Lumberman's Weak "Come-Back"

In answer to a recent story upon safe building, given publicity in an important newspaper through the *Safe,* a lumberman contributed to the same newspaper what he called a "come-back."

It is the lumberman's contention that every dollar put into safe materials is money wasted and, not only that, the interest upon that money should be added to the waste. It was argued by the lumberman that it is much cheaper to support fire departments than to "waste" money in brick, tile, cement and other fire resistive materials.

To meet this rather cold-blooded, dollar-and-cents view of the fire waste it is necessary to resort to figures, and the answer to the lumberman is that figures prove that the money invested in safe materials pays a larger return to the buiding owner than does the most rosy war baby that has been listed in the stock market during its period of fabulous profits.

Leaving out of the argument the human side of the fire loss and its awful toll of life and limb it is found that the lumberman must distort the figures to build for himself an argument against safe building.

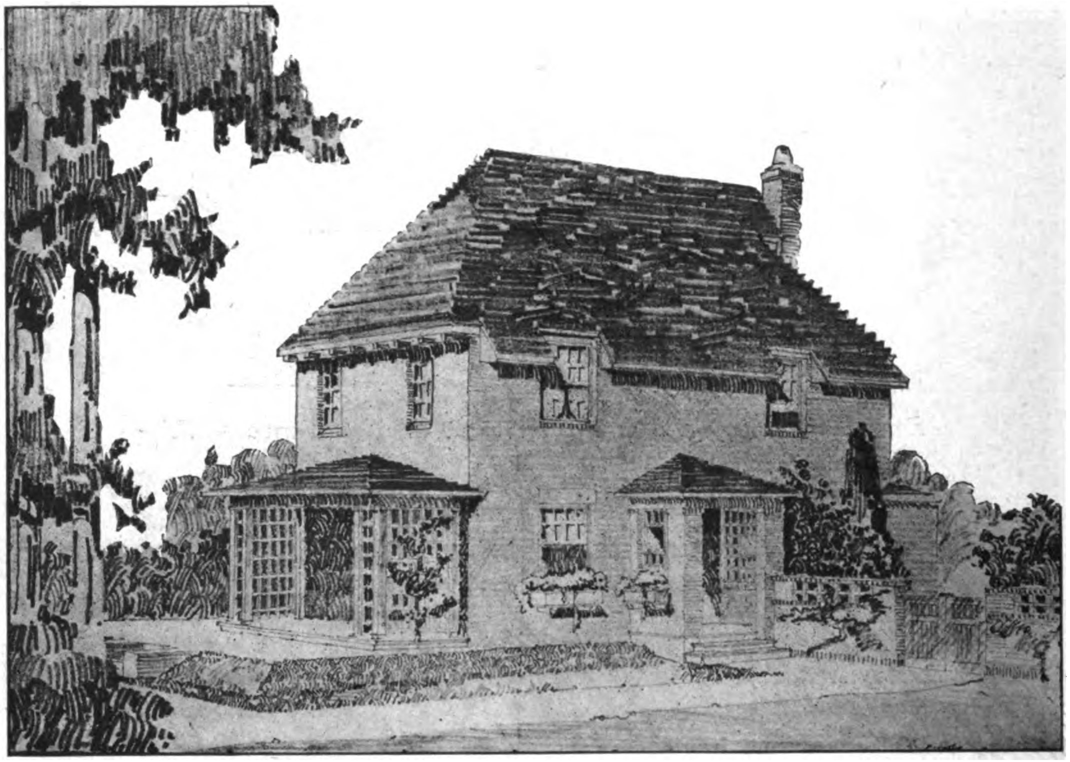
The lumberman took as a basis the $3,000 dwelling, that being about the average cost of single houses in large cities. He argued that it would require an additional expenditure of $1,000 to make that house firesafe. While he exaggerated the difference between frame and safe buildings, that is not the weakest point of his argument. He concludes that upon every thousand houses made fireproof there is a waste of $1,000,000, and that the interest upon this waste amounts to $60,000 a year, while an expenditure of $50,000 a year would maintain a fire department sufficient to cope with that number of burnable buildings.

Truthful figures will show a balance on the other side. If one thousand houses designed in frame to cost $3,000 each were changed to firesafe houses—that is, with exteriors of fire resistive types—the difference in cost would not exceed $300 a house, or $300,000 for the thousand houses. The interest upon this excess expenditure would be $18,000 a year, and not $60,000, as the lumberman estimated.

Now let us look at the debit side of this example:

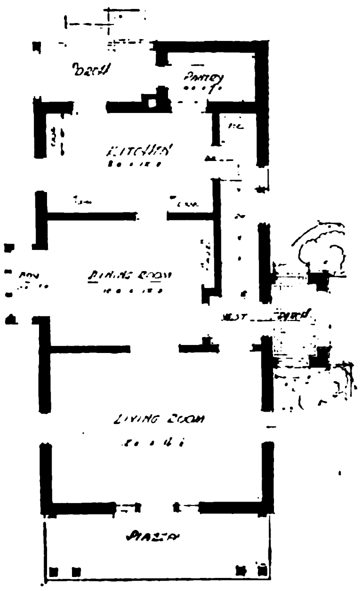
Every frame house must be painted once in two years to save rapid decay of the wood. The average cost of painting a house that cost new $3,000 is $100. That amounts to $50 a year. This item alone would cost the owners of a thousand frame houses $50,000 a year.

Expert building appraisers say that the frame building depreciates three times as rapidly as does the masonry building. In many cities no depreciation is charged upon the brick house for five years, while five per cent is charged off the frame house the first year and usually not less than ten per cent by the end of the fifth year. Thus there would be an actual loss of value—never to be redeemed—of $300,000 in five years, or $60,000 a year. Add to this the upkeep, which it is difficult to set down in figures but an item well known to every person who has occupied a frame house; the difference of fifty per cent in fire insurance cost and one has the strongest argument for the safe house. Instead of a waste the small difference put into the house to give it an exterior of permanent materials becomes a rare investment, paying returns of about fifty per cent a year, which surely puts it in the war-baby class.



HOUSE FOR A NARROW LOT

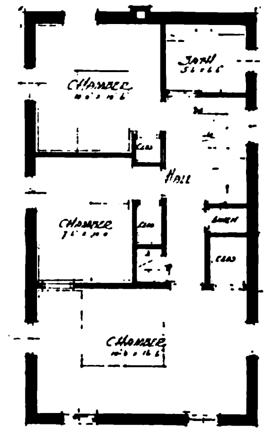
It is often a problem to find a house of suitable design to occupy an exceptionally narrow lot. Most cases, where this is attempted, result in an overcrowding of the lot or a house so small as to be almost unlivable.



In the little house shown, however, Architect Geo. W. Ritchie, 855 Leader News Bldg., Cleveland, O., has designed a real home that may be placed upon a lot as narrow as thirty feet.

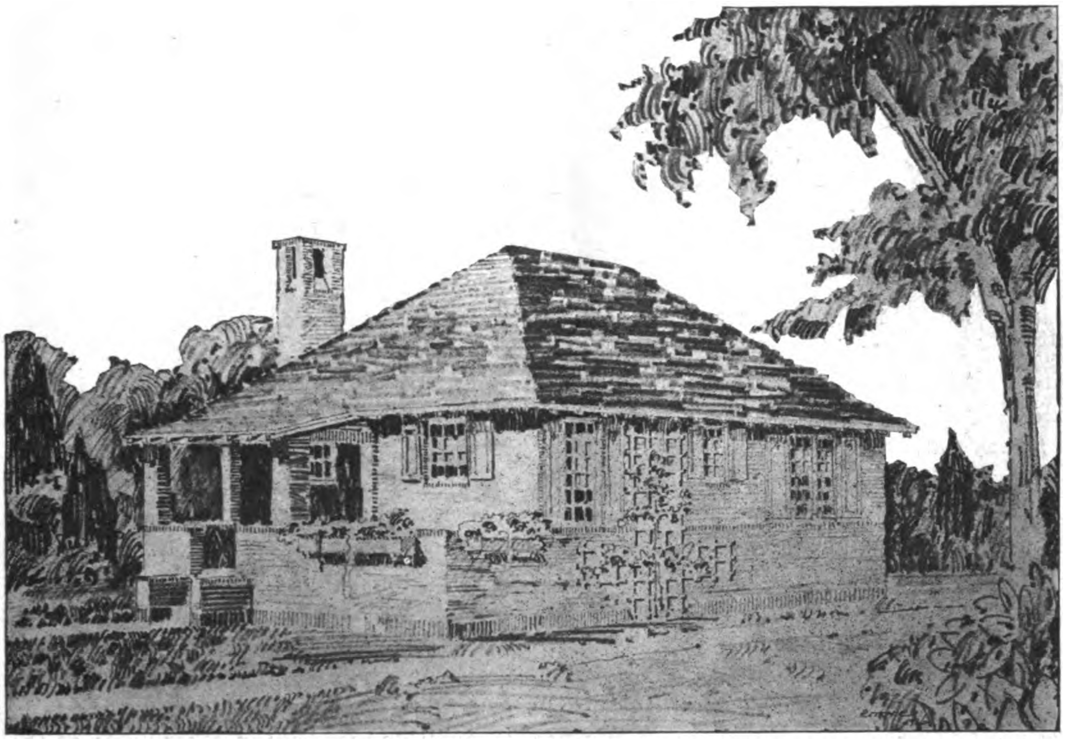
This is accomplished by placing the rooms one back of another, with the entrance and stairway on the side. A glance at the plans will show that he has made every room a good one, with plenty of wall space for furniture and large windows. The flower-bay in the dining room is an added feature of this little plan that will please many.

Brick is the structural material chosen by the architect, although a variety of others are applicable, owing to its simple design. As planned with hollow tile walls faced with an artistic brick, this would make a safe, economical and pretty home.



Bids taken upon its erection in Cleveland range from $4,000 to $4,200, which would represent a fair average in any city of like size.

Complete plans and specifications may be had for



$2.00 at the headquarters of the S-A-F-E, 354 Leader Bldg., Cleveland, or from the Eastern office, Brokaw Bldg., 1457 Broadway, New York.

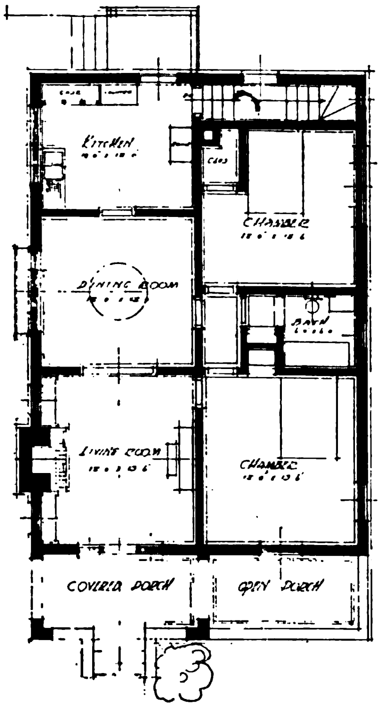
A $3,000 BRICK BUNGALOW

For the woman who has determined to rid herself of the incubus of hired help the bungalow comes nearest to offering a solution of the problem of efficiency in housekeeping of any type of home yet evolved. This fact very largely accounts for its growing popularity.

Built of retardant materials, that is, those which protect alike against heat and cold and fire, the bungalow offers an investment which is small in initial outlay and permanent. A minimum amount of money will need to be spent for upkeep, and fuel bills for heating in the winter will be cut in half.

The design of this little bungalow calls for the use of brick facing over a hollow tile structure. The row-lock and soldier courses provide decoration for the exterior walls and insure against any appearance of plainness resulting from the simplicity of the design. The plan provides every necessity for a small family and is the acme of convenience.

Complete working drawings of this little $3,000 bungalow may be had for $2.00 at either the Eastern office of the S-A-F-E in the Brokaw Bldg., 1457 Broadway, New York, or at 354 Leader-News Bldg., Cleveland, Ohio.



Build Brick Homes Exclusively

"The Brick Homes Company" is the name of a new concern incorporated in Ohio with its principal office in the Williamson Building, Cleveland. This corporation is formed to build only fireproof houses. L. S. Conelly, president of The Conelly Company, one of the largest real estate firms of Cleveland, heads the building company.

"Our company had not formerly engaged in building, but we found such a rapidly growing demand for homes of fire resistive type that we created this new corporation," said Mr. Conelly. "We found that while there always are many frame houses for sale our clients who demanded safe houses were not easily supplied. There was nobody in the business of building brick or stucco houses to sell. That suggested the company specializing in safe houses and our organization has been busy from the day of its incorporation."

The Brick Homes Company announces through its superintendent, Andrew Pentland, that it is prepared to build any type of fire resistive house that may be demanded. It uses tile and brick or metal lath stucco for exterior walls and carries the fireproofing to the interior to just such extent as the owner demands.

"The time is not right for wholly fireproof buildings," said Mr. Pentland, in discussing this feature of their business. "While we find many who insist upon fireproof partitions and floors, much of our business is in supplying homes that are safe from the exterior hazard. We advocate incombustible lath for all purposes and insist upon putting a fire resisting roof on every house we build."

The Brick Homes Company announces that it will erect substantial houses with fire resistive exteriors for from $3,000 up. It is the particular aim of the company to produce artistic homes at low cost, and it prefers the contract for low cost houses to the more expensive types.

The company is one of the fruits of the S-A-F-E work in Cleveland, where the prospective builders are being told 365 days in each year that it is cheaper in the long run to build safe. This gospel is gradually spreading throughout the country and the Society, through its members in other parts of the country, is distributing its literature and planting the seed of safe building in a national way.

"The Power Behind the Plans"

That the woman is "The Power Behind the Plans" is common belief of those who have much dealing with prospective home builders. Many architects say that no house is accepted until it satisfies the woman.

The following letter received by The S-A-F-E shows that CONSTRVCTION reaches the "seat of power":

"782 Yale Street, Akron, Ohio.

"MAY 17, 1916.

"GENTLEMEN:

"I have decided, through the influence of your magazine, to build a home of fireproof material.

"Will you kindly send a copy of the book of plans you recently issued, and oblige

"Mrs. Anna K———."

This is one of many, but S-A-F-E is particularly proud of it because it comes from a woman. Hundreds of people are converted to safe construction by every issue of CONSTRVCTION and the work of the S-A-F-E which follows.

Firesafe Buildings Only

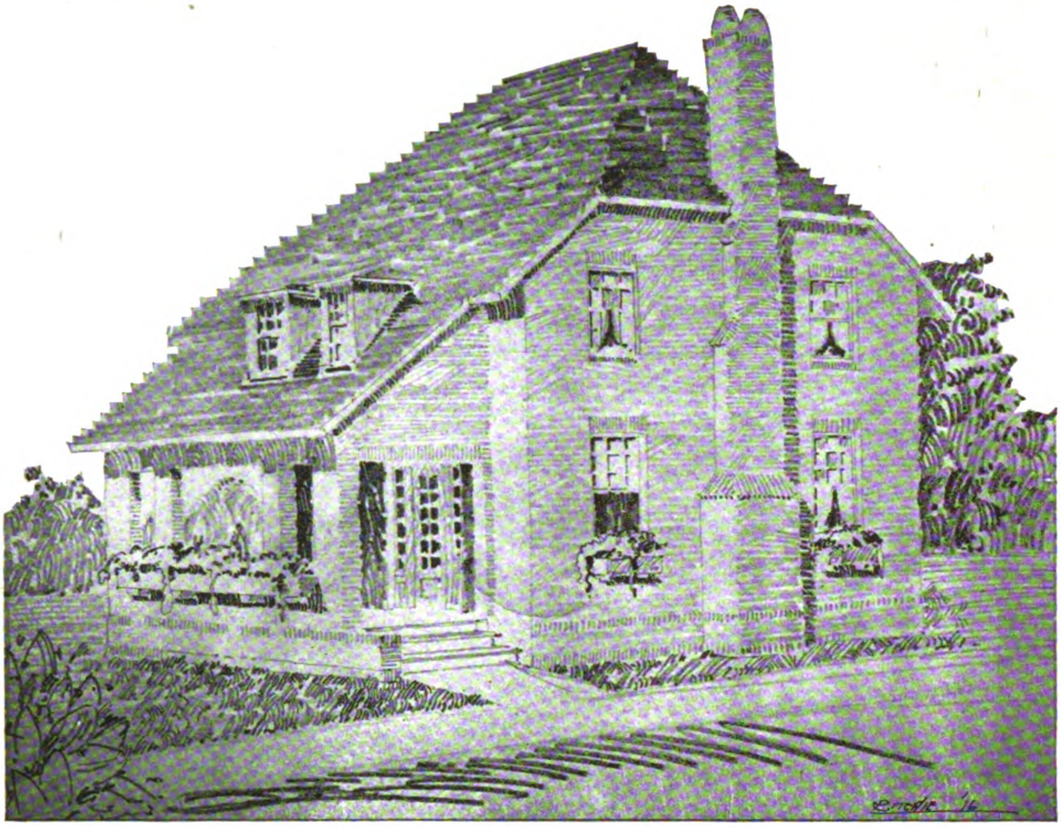
Fifteen buildings, all brick and of firesafe construction, are now being erected at Lexington, S. C. These will replace the wooden structures destroyed in the severe fire of April last. The buildings now underway include the following: Edwin G. Dreher, clothier, two large department buildings; R. L. Connelley, two; W. W. Barre, two; Dr. E. P. Derrick, one two-story structure; Scott Hendrix, two; Samuel D. George, three, and the Bank of Western Carolina.

Poor Flue Construction in the South

In the opinion of a leading underwriter who has given attentive study to the matter, poor flue construction is largely responsible for the excessive number of dwelling house fires that have taken place in the Southern field during the past few years, and have now reached such proportions that insurance companies are severely curtailing their lines upon such properties.

Educational Campaign Needed

F. O. Hawkins, a leading agent of Montgomery, Ala., urges an educational campaign in an endeavor to reduce the fire waste of the town. The application of heroic means to Birmingham brought a decided improvement in the loss record of that city, and the same is true to a lesser degree of Montgomery. Elsewhere throughout the State, however, conditions are bad, and the citizens generally need to be aroused to the fire hazard of the commonwealth.



A HOUSE SUITED FOR A CORNER

THE average house placed upon a corner lot usually is decidedly out of place. Designed for an inside location it has but one sightly façade, and that the front. If either side is placed toward a side street its appearance usually is no credit to the owner.

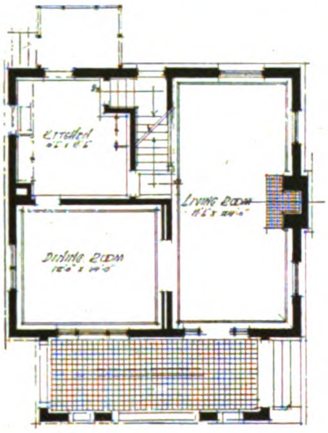
While designed primarily for an outside location, the house illustrated in the accompanying cut may be used to advantage upon a corner. Thus the porch would face one street and the entrance be from the other.

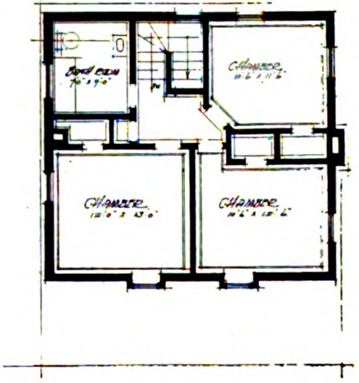
For a small house it has an abundance of room, the individual rooms being nearly square and not cut up as is often the case. The living room is exceptionally ample. The dining room, likewise, will provide for a large party with comfort.

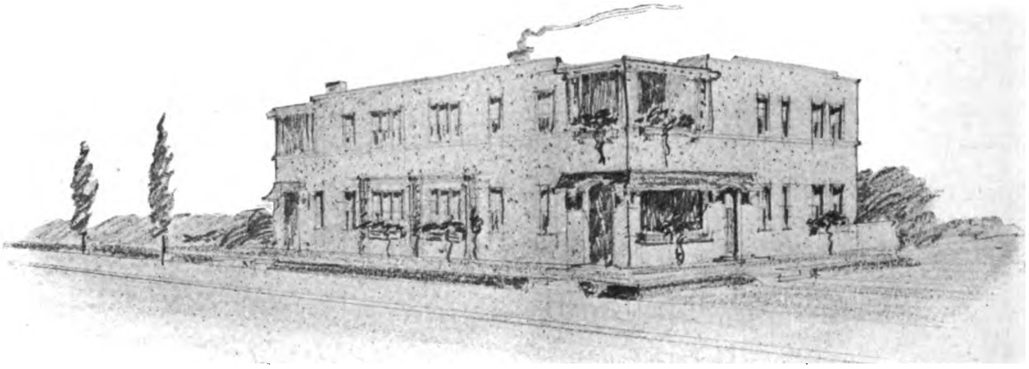
The chambers have each a good closet and are lighted and ventilated from two sides.

From bids taken in Cleveland, this house may be erected for from $3,500 to $4,000.

Complete working drawings and specifications for this house may be secured for $2.00 from the S-A-F-E at 354 Leader-News Bldg., or from the Eastern office located in the Brokaw Bldg., 1457 Broadway, New York.







Brick for Investment Buildings

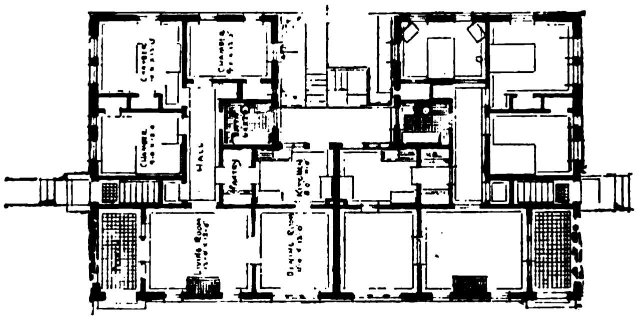
One of the most common uses of face brick at present is for apartment buildings. In many cases the brick does not show to the best advantage, owing to inferiority of design.

The accompanying cut shows the possibilities of four-family flat planning. This little building is exceptionally simple, but the plain walls give excellent opportunity for the artistic use of face brick, while reducing cost to the minimum.

It is of course simply a suggestion of an artistic development of a corner lot, with an apartment giving each family a private entrance.

Even in a building erected for revenue only there is no need to employ stereotyped design. The flexibilty of brick as a structural material makes possible individuality at no increased cost.

In cities the four-suite apartment is a popular investment property. The business of building them, however, is being injured by the lack of good designing, and they will grow in disfavor, just as the so-called "real estate" house has done, unless the stock, or stereotype, plans are abandoned and architects engaged to put some art into the structures.



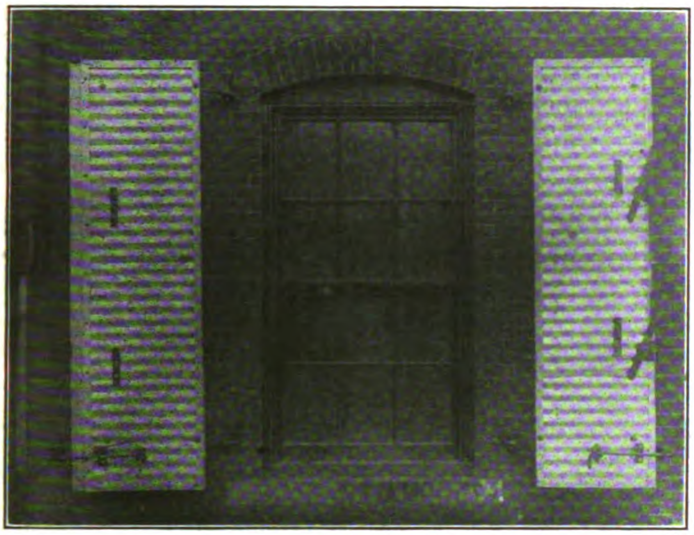
You are vitally interested in having safe homes built in your city for two reasons: first, because of the tremendous individual loss of property value of cheap construction, which falls upon propertyowners; and, second, the enormous loss of tax-earning power falling upon your city when property depreciates rapidly.

Contrasting frame and safe construction on an equal length of time, it has been found that frame buildings lessen in value three times more than safe buildings.

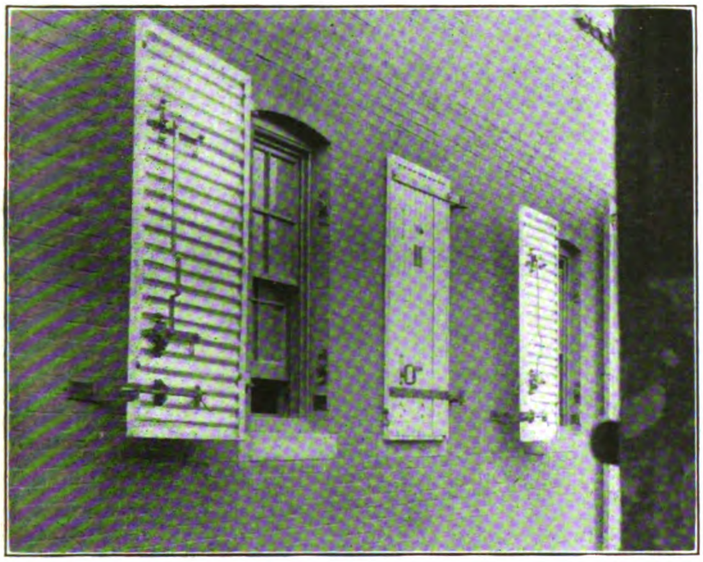
The average depreciation on masonry dwellings is less than five per cent. This depreciation means a permanent exhaustion of values, not a market decline.

An Excellent Type of Approved Metal Swinging Fire Shutter

THE accompanying photographs illustrate the single and double types of the Evans "Almetl" Fire Shutter installed in the office section of the building occupied by the Northeastern Warehouse Company, Sedgely Avenue, below Erie, Philadelphia, Pa.



In the last (May) issue of CONSTRVCTION, in the article entitled "Protecting Building Exteriors Against Fire," illustrations of a similar shutter were shown with a caption to the effect that the shutter there shown was the only swinging shutter approved by the National Board of Fire Underwriters for protection of window openings. This statement constituted an error on the part of the writer.



The Northeastern Warehouse Company carries Mutual insurance and the shutters here shown were installed to fully meet the Mutual requirements and have been approved by them. The Underwriters' Laboratories, Inc., Chicago, has authorized their label service for the "Almetl" shutters manufactured by the Merchant & Evans Company, and many of them are in use throughout the country.

Pennsylvania Architects Want Protection

Architects are considering the preparation of a bill for presentation to the next State Assembly which is intended to afford professional building designers the protection they feel they are entitled to. In the State anyone is permitted to design dwellings or any other class of buildings, and so long as the designs conform to legal building requirements, as to safe construction, nobody in authority has a right to ask the designer to show his architectural certificate. Plumbers and many other members of the building craft have to be duly registered and licensed, and must have served apprenticeships. But anybody is allowed to design the structures on which these craftsmen work. The professional architects feel that they should be given like protection, and that nobody should be permitted to design buildings unless he is a professional designer—one who is fully competent and has learned the art thoroughly. Professional architects claim that it is because anybody is permitted to plan dwellings and apartments that so many of them are unattractive and unsatisfactory and often unsanitary and well-nigh unsafe.

Architects spoken to on the subject feel that home communities would be much more beautiful architecturally if home designing was only permitted by licensed and certified architects. In some States and in certain cities, notably Paris, only such construction is allowed—and Paris is noted as one of the most beautiful cities in Europe. In Pennsylvania the man who gives his time, thought and money to learning the architectural profession thoroughly is afforded no protection against the builder who thinks he is an architect, and who, more than any other, does most to spoil the collective beauty of home communities by putting up poorly planned and unattractive dwellings of his own designing, simply to avoid having to pay some professional architect for doing the work right. If given proper protection, architects would gladly pay a reasonable license, but they would require that no license should be granted unless the applicant therefor can prove himself competent by passing an examination before a city or State commission composed of qualified members of the architectural profession.

After years of agitation on the part of various fire commissioners New York City has finally appropriated $875,000 for the replacement of the present fire alarm system in the Borough of Manhattan. It is also probable that the service in the Borough of Brooklyn and the Borough of the Bronx will be improved during the present summer.

WEATHER: Always warm in winter and cool in summer if you are in a firesafe home, office or factory building.

The Fireproofing News

LATEST EDITION

CONTAINING DETAILED DESCRIPTIONS OF NEW DEVICES AND APPLICATIONS OF MATERIALS WHICH ARE OF REAL VALUE IN FIRESAFE BUILDING: ALSO NOTES ON THE LATEST BOOKLETS, CATALOGS AND OTHER FIRESAFE LITERATURE, WITH OTHER ITEMS OF INTEREST TO THE FIREPROOFING FRATERNITY

Copyright by Construction Publishing Co., of New York, N. Y., 1916

New York City, N. Y., June, 1916 Priceless

GOVERNMENT TO INVESTIGATE FOREIGN TRADE

The most extensive investigations into foreign market conditions ever undertaken at one time by the Bureau of Foreign and Domestic Commerce, Department of Commerce, will be under way soon after the beginning of the new fiscal year in July. These investigations will be aimed at the newer and more undeveloped markets lying well outside of the fighting zone, especially those in South America, China, India, Africa and Australia. Twelve different lines are to be investigated and fifteen distinct examinations to find suitable agents for the work have been announced.

For South America agents are being sought to study and report on markets for construction material and machinery, fancy groceries, furniture, glass and glassware, jewelry and silverware, motor vehicles, paper and printing supplies, railway supplies and stationery and office supplies. In the Far East, Africa and Australia a study will be made of the market for boots and shoes, electrical goods, motor vehicles and railway supplies. One agent is also sought for to look into possibilities for American commercial and industrial investments in South America, and another to make a similar study in the Far East.

The difficulty the bureau has experienced in getting suitable men for its foreign investigations illustrates the lack of trained men for foreign commercial work which has so often been called to the attention of Americans in the last year. There are plenty of men capable of sizing up market conditions in any part of their own country, but there is a different story to tell when a man is wanted to study the prospects of selling goods in a foreign country. For South America, for example, the Bureau of Foreign and Domestic Commerce wants men who can speak Spanish, who understand their particular line well enough to learn the essential facts so necessary to American exporters, and who, when in possession of these facts, can write them up in clear-cut, logical, convincing fashion. Such men are scarce. For investigations in the Far East a foreign language is not essential, although extra credit will be given in the examination for a knowledge of French, German or Spanish.

NATIONAL FIRE PROTECTION ASSOCIATION HOLDS MEETING AT CHICAGO

Highest Grade of Fire-Resistive Construction Defined—Long-Turn Elbows Recommended —All Officers Re-elected

Fire-resistive construction for office buildings was defined in a report by a committee of the National Fire Protection Association, May 9, 10 and 11, in Chicago. Ira H. Woolson is chairman of the committee and R. L. Humphrey presided at the session at which the report was presented.

The terms "full," partial" and "temporary protection" are still to apply to structural materials and types of construction, but they are discontinued as applied to completed structures. Three grades of building in each class are to be recognized hereafter. The purpose is to secure, in grade A, the highest practical type of fire resistance. Grades B and C provide for permissible modifications. The committee report was accepted and referred to the executive committee with power to act.

A report on uses of wood in building construction was anticipated, but only a brief verbal progress report was submitted by Julus Franke, chairman, of New York.

Various changes in specifications for indicator posts were suggested by H. O. Lacount, chairman of the committee on hydrants and valves. The aim is to raise the standard of workmanship, to improve the present type of post by standardizing the target mechanism and to outline a new design for rising-stem indicator post which overcomes some of the criticisms of the target mechanism.

Long-Turn Elbows Recommended

W. O. Teague, chairman of the committee on standardization of pipe and pipe fitting, brought in a progress report giving the results of an investigation by the Factory Mutual Laboratories on friction lost in screw and elbows of 2½, 4 and 6-inch diameter. In view of the conclusion that the friction loss of standard elbows is 50 to 100 per cent greater than that of long-turn elbows, the committee recommended the use of the latter.

More or less critcism was expressed in regard to the practice of permitting reports to be presented and passed without full previous consideration. It was explained that specifications may thus be promulgated which are not representative. The matter was placed in the hands of the executive committee to formulate a policy requiring all reports to be prepared well in advance so that they might represent mature consideration. This would remove possibility of criticism that insurance interests were trying to foist on the public anything to which they were not entitled.

All the officers were re-elected: Charles E. Meek, president; Louis Wiederhold and D. Everett Waid, vice-presidents; Franklin Wentworth, secretary-treasurer.

The Fireproofing News

BIG NAVY YARD FIRE WRAPPED IN MYSTERY

City Department Called on for Aid and Crowds are Stopped at the Gate—Details Guarded

Maps of N. Y. City's Defenses Menaced by Blaze Next Door to Residence of Admiral Usher

Papers of the utmost importance to the Navy Department, maps of inestimable value and diagrams of proposed improvements on battleships, were threatened with destruction in a mysterious fire in the Brooklyn Navy Yard last night.

Every effort was made to keep the details of the fire secret. It was of such seriousness, however, that for the first time in many years the city fire department had been called upon to aid in extinguishing a blaze within the enclosure. The Navy Yard apparatus was entirely inadequate to subdue the flames.

Shortly after nine o'clock a sentry saw flames issuing from the three-story structure known as the Boat Building. This adjoins the office and residence of the commandant, Rear Admiral Nathaniel R. Usher.

Defense Maps There

The building houses the only copies of maps showing the defenses of New York City, and other details not even on file at Washington. It also contains papers showing the disposition of the Atlantic and Pacific fleet and drawings of inventions now being placed on some of the battleships and dreadnaughts.

An alarm was sounded by the sentry. It was feared the flames would communicate to Admiral Usher's office, and Deputy Chief Lally was called upon for aid. Engine companies, ladder wagons and apparatus of all kinds were hurriedly dispatched to the Sands street gate. There the firemen found a squad of marines.

One piece of apparatus was admitted to the Navy Yard at a time. Every fireman was counted. The same procedure was followed as they left the scene. The chief in charge of each battalion was requested by the Navy Yard officials to vouch for the identity of every man in his command. None was allowed to enter or leave the yard during the progress of the fire.

Crowd at the Gates

The squad of marines remained on duty throughout. A large crowd congregated outside of the gates but they were kept on the move by police, assisted by the marines. Even newspaper men were barred from entering.

There were rumors that the fire was of incendiary origin. Rear-Admiral Usher and other officers of the Navy Yard were non-communicative. Every detail was closely guarded.

From one source it was learned the fire started in a pile of rubbish. The dynamo supplying electricity to the yard is located in the Boat Building. One of the sailors said this machine had been throwing off sparks all evening, and it was possible that one of these might have set fire to the rubbish.

The damage is not known. Navy Yard officials requested Chief Lally to notify his men not to discuss the fire.

This fire, which might have easily developed into a blaze of sufficient magnitude to very seriously cripple the entire Brooklyn Navy Yard, offers government officials a strong argument for consistent firesafe construction, both as regards the buildings and the entire interior equipment, including, of course, firesafe lockers, desks, cabinets, safes, etc.

FEDERAL TRADE COMMISSION COMMENT ON AMERICAN BUSINESS METHODS

Edward N. Hurley, of the Federal Trade Commission, in an address before the Boston Commercial Club, describing the propositions of government co-operation with the business interests of the country, voiced some highly interesting facts which were brought out from a year's investigation by the commission. Among the startling disclosures mentioned by Mr. Hurley that present abundant material for constructive thought and action are the following:

"Groups of business men are constantly coming before the Federal Trade Commission, asking for information as to how they can improve conditions. Manufacturers come to us protesting against overproduction or complaining against their competitors, claiming unfair methods of competition and asking us for relief. They assert their competitors are selling goods below cost and ruining the industry in which they are engaged. For these evils, often of many years' standing, they request relief.

"The Federal Trade Commission has been in existence one year, and after surveying the field we found from a preliminary investigation that 200,000 corporations out of a total of 260,000 engaged in the manufacturing and mercantile business of the United States were eking out an existence; 100,000 of them did not earn a penny. Out of 60,000 successful corporations doing a business of $100,000 a year over 30,000 charged off no depreciation whatever. Only 10 per cent of our manufacturers and merchants know the actual cost to manufacture and sell their products: 40 per cent estimate what their costs are, and 50 per cent have no method but price their goods arbitrarily. Most of the manufacturers and merchants who do not know what their goods cost are basing their selling price on what their competitors sell for and with only this knowledge for a basis they are frequently cutting prices and demoralizing the industry in which they are engaged."

The Remedy

There are some thought-provoking statements here regarding our business integrity and American shrewdness, and while the applications are wide and apply to a large variety of industries there is little doubt but that a part of them certainly could be directed to firesafe industries, in which manufacturers have sacrificed their profits by competing with each other instead of affixing a proper price to their products and putting that strength back of their sales and advertising departments which they squander in cut-throat competition with brother manufacturers.

The remedy for such conditions is not with the government but with the men in the industries. It would seem that the government is following a practical program in pointing out the errors and assisting the trades to help themselves. Surely it is the part of the business men to cooperate for the improvement of their own interests, thus avoiding possible antagonizing activity on the part of the government and working toward an end which generally means increased profits and bigger business.

"Waiter—A Dish of Firesafe Chicken"

Six fine fat hens have been selected by Food Commissioner John J. Dillon, of New York, as his "poison squad." He wants to find out just what effect cement, sand and various other building materials have on the stomachs of chickens.

The Commissioner for several days has heard men in the poultry business testify that shippers and commission men give the chickens an odd menu to make them weigh heavier to market. In some instances they die before they reach the butcher. This is the bill of fare:

Red pepper, mixed with flour and buttermilk; gravel from Joplin; cement from Portland; ground oyster shells from anywhere; sand, pebbles and corn meal.

According to the Commissioner the combination forms a sort of Gibraltar in the crops of chickens. He wants to determine exactly what effect the construction food has on the poultry. The gastronomical experiment will be public, so housewives may see how they purchase building material for chicken.

* * *

A 32-page book on Kahn Pressed Steel Joists and Studs, showing applications, tables and details has just been published. Book is standard size of architects' literature—8½x11 inches. Copy can be secured from the Trussed Concrete Steel Company, Youngstown, Ohio.

* * *

A helpful little booklet entitled the "New Building Ordinance of New York City and the Use of Steelcrete Mesh" has been issued by the Expanded Metal Engineering Company, 101 Park avenue, New York. As its title shows, the booklet presents the new building rules as they apply to the use of reinforcement in concrete construction. It is illustrated with technical drawings and has numerous tables worked out as a ready reference for engineers. The size is such that it can be placed into the ordinary contractors' or engineers' notebook, and two holes are punched through for use in metal clasp books.

School to Teach Concrete Construction

Rochester, New York, schools devote particular attention to vocational studies and at the present time operate one of the best school shop systems in the United States. The Shop School building is located in Exposition Park, and naturally is visited by many teachers and educators who are on sight-seeing trips in Rochester. Although manual training is taught in some of the other schools, all of the advanced work is done at the shop schools, which also provide more or less normal training for manual training teachers.

On Tuesday, May 23, A. J. R. Curtis, director of the Extension Division, Portland Cement Association, gave a lecture before the manual training and vocational teachers of Rochester, on manual training in concrete. The interest in this work is spreading to all sections of the country, largely through the facilities which have been afforded by the Portland Cement Association in a well planned outline with series of lesson exercises, thus making the work very easy for the teachers to put into operation. An idea of the interest which was evidenced by Rochester manual training instructors may be gleaned from mention of the fact that practically every manual training teacher of the Rochester school system was in attendance at Mr. Curtis' lecture. After the lecture, Mr. C. M. Roefer, field demonstrator of the Extension Division of the Association, mixed a batch of concrete and showed the process of fence post manufacture.

Col. Moulthrop, superintendent of the Shop School, announced that courses in concrete work would be maintained next year in both day and evening classes in Rochester.

SLATE TRADE APATHY

It appears that not alone in the United States is the slate trade apathetic over extension of business. The same condition prevails in England.

"It is a notorious fact," says a London paper, "that, as a body of traders, quarry-owners and slate

(*Cont. 1st col., page 376*)

$30,000,000 Building Project Proposed on Long Island

An American Versailles is to be built on the north side of Long Island, New York, at an estimated cost of $30,000,000. According to Penrhyn Stanlaws, president of the organization, ground will be broken about July 15. About 180 acres of land have been purchased and plans are being completed by Carrère & Hastings, architects, 52 Vanderbilt avenue, New York City.

N. F. P. A. Takes Significant Action

Significant action by the committee on fire-resistive construction of the National Fire Protection Association was reported and approved at the recent annual convention in Chicago, as noted elsewhere in this issue. The previously adopted terms "full," "partial" and "temporary" protection, as applied to buildings of various classes, are to be applied in the future only to the structural materials and types of construction, and not to the completed structures. Instead, the detailed specifications now to be prepared by the committee for different classes of buildings will recognize three grades in each class—Grade A, Grade B and Grade C. The purpose is stated to be to secure for Grade A the highest practical type of fire resistance, and to have Grade B and C allow for permissible modifications. The practical wisdom of this change in principle, which will permit the future work of the committee to proceed along the lines of best economy for a completed structure, allowing the use of minor structural parts just sufficient in fire-resistive quality for their purpose, is quite evident. On the other hand, it is of vital importance that careful discrimination and judgment be exercised by the committee in permitting and limiting the use of sub-standard construction in minor parts.

TWENTY-YEAR GUARANTEE BOND

Under the above title the Barrett Company, of 17 Battery Place, New York, is sending to the trade the following letter:

"We take great pleasure in giving you advance information of an important step that we propose taking in connection with Barrett Specification Roofs.

"Our experience has convinced us that with the workmanship properly safeguarded, a Barrett Specification Roof will last for a minimum period of twenty years without repairs.

"We now want to give the benefit of this experience to architects, engineers and owners of Barrett Specification Roofs in the very practical and convincing form of a Twenty-Year Surety Bond Guaranty.

"This guaranty will be given hereafter, without charge, on all Barrett Specification Roofs of 50 squares or more in the United States and Canada, in towns of 25,000 and over, and in smaller centers where our inspection service is available—provided the roof is laid by a roofing contractor satisfactory to us and in strict accordance with The Barrett Specification dated May 1, 1916, and subject to the inspection and approval of The Barrett Company.

"We shall give this matter wide publicity in the architectural and engineering magazines, and in other national magazines carrying our advertising.

"We have already notified the principal roofing contractors of the country of this new addition to Barrett Service and we are preparing a list of roofers in each locality who have agreed to work with us under this new plan.

"We shall be glad to supply you with such names, if you desire, in order that there may be no delay in furnishing estimates on Barrett Specification Roofs to be constructed in accordance with The Barrett Specification and providing for the Twenty-Year Surety Bond Guaranty.

"This Surety Bond will be issued by the U. S. Fidelity & Guaranty Company of Baltimore, one of the largest and best known surety companies in this country.

"A copy of the new Specification is enclosed herewith. If there is any further information you desire, kindly write our nearest office and the matter will have prompt and careful attention.

"We ask your hearty co-operation in this new departure, engineers and owners of buildings, in that they will have without cost an inspector on the roof whose only object is to make it as good as possible."

Competition in Workingmen's Houses

A competition in houses for workingmen involving plans, sketches, grouping and arrangement has been announced by the National Americanization Committee with the co-operation of various societies and institutes of architects and engineers. Prizes aggregating $2,100 are divided into two groups, the first of which covers plans for the housing of workmen in industrial communities not exceeding a population of 35,000. Entries of this class include plans for: First, single family houses; second, combined family and lodging houses which will permit separation of the family from the lodgers; and third, boarding houses or community dwellings for numbers of single men or of single women.

In the second group two prizes are offered for a satisfactory substitute for the derailed freight and cattle cars now used to house construction gangs on railways.

The aim of the contest is to arouse interest in the subject of the housing of workmen in industrial communities and to produce carefully worked out and entirely practicable housing plans and standards which it will be possible for employers and workmen and communities alike to demand and insist upon.

Inquiries concerning the competition should be addressed to the National Americanization Committee, 20 West Thirty-fourth street, New York.

"Building Your Building Right"

The Ferro Concrete Construction Company, Cincinnati, Ohio, is responsible for as interesting and artistic a booklet as we have seen from a firm of contractors and engineers. "Building Your Building Right" is the title of the work, the chapters of which are devoted to a presentation of the Ferro method of reaching the lowest cost consistent with efficient service, the solution of problems relating to the purchase of materials, detailed costs, labor, the important matter of completing the job on time, the different types of concrete construction, the contract forms, and the relation between the architect and the contractor.

An interesting chapter is the last, entitled "After Your Building Is Finished," which reads: "Certainly the responsibility of the contractor should not cease with the delivery of the finished work.

"At this time, which represents to you the beginning of the returns on your investment, the Ferro Concrete Construction Company considers that it is beginning also to deliver to you the service for which it has contracted. It stands back of the building as an established, responsible, engineering construction firm, guaranteeing that you will receive throughout the life of the building the service rightly expected.

"Furthermore, the Ferro Organization keeps actively in touch with its clients, ready at all times to furnish consultation service on any conditions arising through the use of the building, the necessity for alterations, additions or changes.

"In short, a contract with Ferro is not a contract for a "job," but is a contract for a complete building service, that begins, if you will, with the planning of your building and ends only when you want to terminate it."

The booklet contains many fine photographs of buildings representing the work of this organization.

* * *

The National X-Ray Reflector Company of Chicago, Ill., have published a very interesting folder descriptive of Flood Lighting, which shows in detail how Flood Lighting is accomplished by their Projector Units.

Firesafe Construction in the New Y. M. C. A College in Chicago

In an excellent and comprehensive article in the May issue of *The Architectural Review,* dealing with the Y. M. C. A. College in Chicago, appears the following paragraphs describing the firesafe features incorporated in this structure:

"In the construction of this building, not only have means been provided for extinguishing a possible fire, but all the materials that have been effective in the best fireproof structures have been used. For structural purposes steel columns have been used in the walls where they have to support girders or trusses of long span, while reinforced concrete columns have been used in brick piers where practicable. Some of the girders up to a span of 38 feet are of reinforced concrete (see Fig. 16), while others, as, for instance, those under the gymnasiums, are of built-up steel, protected by hollow tile. Generally the floors are constructed with concrete slabs and tension bars, with hollow tile fillers. Everywhere the floors are finished with cement or tile, except in the two gymnasiums, where they are of hard wood. Only such woodwork as has been absolutely necessary has been used for the inside finish and doors, all of which are of red gum. The whole building, therefore, is not only fire-resisting, but incombustible as far as possible. All interior walls, where possible, are of brick, and a minimum of hollow tile partitions has been used. All plastering is directly on brick or hollow tile.

"Fire protection at a minimum of cost is provided by provision for yoking together a battery of four of the steam pumps which ordinarily serve for other purposes, thus making available the combined power of these pumps and the reserve storage of water contained in the swimming tank."

---

merchants have been exclusive and unapproachable. They have lived in a sort of fool's paradise believing that it was impossible that anything could be substituted for roofing purposes. It is predicted that when the war is over the slate trade will revive, but in order to get the full benefit from the revival those interested in the slate industry must organize and advertise. Had there been a little more organizing and advertising in years gone by and less aloofness and superciliousness on the part of quarry-owners and slate merchants, etc., the industry would not be in the deplorable state in which we find it today."

A CAVSE OF VNREST

Vndovbtedly for everything there is ample cavse; far be it from the likes of me to knock on natvre's laws. Bvt why do modern architects assvme that U is V, and carve in stone that palpable and bold absvrdity? The langvage vsed to be so poor, so terribly in debt, that it covld not afford a U to grace the alphabet.

Bvt now that we possess the U with soft and gracefvl cvrve, of vnexcelled docility and willingness to serve, why do they carve Vnited States and Pvblic School and svch, and make the English langvage look as fvnny as the Dvtch, with Restavrant and Pvllman car and Vniversity and other marks of edvcational perversity?

That V impresses some of vs as cheap and gavdy blvff, which parvenves may pvll in place of more svbstantial stvff; bvt people who are fashioned ovt of vnpretentiovs dvst view all svch affections with an vnassvmed disgvst. Svch exhibitions always make me very glvm and blve; now, honest injvn, don't they have the same effect on yvu?—Printers' Ink.

Johnson on Sub-Committee

A. N. Johnson, for many years Illinois State highway engineer and now consulting highway engineer for the Portland Cement Association, has just been appointed chairman of a sub-committee of Committee D-4 of the American Society for Testing Materials. This sub-committee is to investigate and report on tests for concrete aggregates in concrete roads. Mr. Johnson's committee is to hold meetings between now and June 29, on which date it will make its first report at the Atlantic City meeting of the American Society for Testing Materials.

Government and Trade Press Should Co-operate

Dr. Edward Ewing Pratt, chief of the Bureau of Foreign and Domestic Commerce of the Department of Commerce urges a more complete co-operation between this bureau and the trade press.

"We are both going in the same direction," he said. "The Bureau and Department are endeavoring to build up the commerce of the United States, and I have found that the trade papers are not only honestly trying to build up their respective industries, but are succeeding nobly. I believe that the trade papers are the most effective agencies for trade promotion and industrial betterment that exist."

Portland Cement Ass'n Opens N. Y. Office

The Portland Cement Association has recently opened a New York office, which is located in the Architects Building, 101 Park avenue. With the addition of this office the Association now has five branch offices, others being in San Francisco, Atlanta, Kansas City and Dallas. Lewis R. Ferguson is manager of the New York office; H. E. Hilts, manger of the San Francisco office, which is located at 116 New Montgomery street; W. B. Elcock, manager of the Atlanta office, located in the Hurt Building; J. B. Marcellus, manager of the Kansas City office, located in the Commerce Building; Freeman F. Gross, manager of the Dallas office, located in the Southwestern Life Building. These branch offices, so advantageously located, considerably facilitate prompt handling of Association matters in the territories in which the offices are located, as the managers of these offices are practically in charge of affairs in their particular territories.

Detroit May Have Firesafe Mayor

Chas. H. Bryan, a Detroit brick manufacturer, is the choice of his friends for the next mayor of Detroit, this fact having been brought to light at a dinner held recently by the Builders' and Traders' Exchange. Mr. Bryan, who is a member of the Mercier, Bryan and Larkins Brick Company, and who is prominent in the clayworking industry, has enjoyed considerable municipal distinction, having been appointed by the present mayor as a member of the lighting committee. He also holds a position in the local Chamber of Commerce.

* * *

NEW BRICK PLANT

A number of large general contractors, including J. L. Robinson, H. N. Leighton and F. G. McMillan, are interested in a large new brick manufacturing plant for Minneapolis, where the Minnesota Brick Company has been organized to succeed the Minneapolis Clay Brick Company. An immense new plant is to be set up as soon as possible. It is planned to be in condition to produce brick this summer. The plant will cost about $400,000 and the construction work is under the experienced charge of G. E. Luce, engineer of the Illinois Brick Company, Chicago. Mr. Luce has been conducting a series of tests of local clays, at a cost of $14,000. The new plant will be located in the northeast section of Minneapolis, where an abundant supply of clay exist.

* * *

Kno-Burn Metal Lath

An exhaustive and practical book has been put out by the North Western Expanded Metal Lath Company, Old Colony Building, Chicago, Ill., covering the wide range of service of "Kno-Burn" Metal Lath. The work is well printed on tinted stock, large type well spaced makes easy reading and the illustrations are exceptionally clear, especially in showing various construction details; in fact, great care is evidenced to make the book of utmost practical service to those contemplating the installation of metal lath. It is a work well deserving the attention of architects, engineers and owners. The Company will be glad to forward a copy gratis to all interested in firesafe lath.

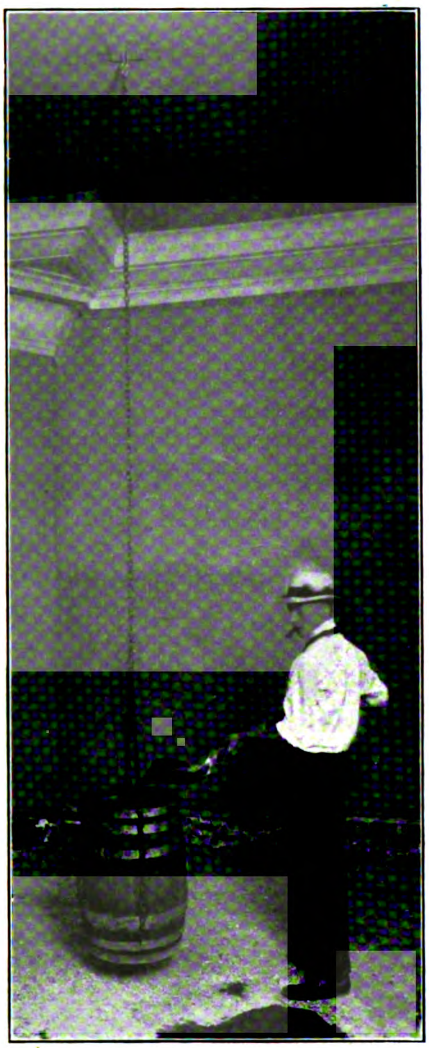
* * *

"What ruined your business?"
"Advertising."
"How?"
"I let it all be done by my competitors."

"PAR-LOCK"

Any method of construction that assists in the safety of buildings where there are fire hazards or other dangers is of interest to the building fraternities.

One of these hazards in buildings, especially of the fireproof type, is in the danger of plaster falling from structural surfaces to which it has been applied. To overcome this danger a process has been developed that has been in satisfactory use for nearly three years.



The process is known as "Par-Lock" and consists of driving under heavy air pressure a highly refined asphalt material into and on the structural surface by a specially designed gun or nozzle, which does not atomize the material, but keeps the material in the form of an unbroken film. This film is pounded or driven into the surface by an independent air supply issuing from the nozzle. It is claimed that this material is driven in the pores and interstices, actually lining all of these interstices or channels, and is built out into a continuous heavy film over the entire structural surface. Immediately following the application of the asphalt material (which is Life Kote Dampproof Bond, manufactured by the Union Products Company, of Cleveland, Ohio) a graded crushed silica sand is applied to the still wet surface under low air pressure.

The whole mastic thus formed is then permitted to harden naturally. This hardening occurs by the gradual elimination of the volatile vehicle and is not hastened by any artificial oxidizing agents or hardeners. The result is, that the mastic has a definite strength, being held to a concrete surface with known strength of pounds per square inch and the rough key formed by the crushed silica also holds the plaster by mechanically gripping it with a definite strength.

It is claimed that such definite figures of strength have been developed after a number of tests by scientific institutions and that the art of obtaining a secure attachment of plaster to structural surfaces is thus placed upon a definite engineering basis instead of being a haphazard uncertainty, as in the past.

The illustration shows a test wherein "Par-Lock" held plaster to a strain of 140 pounds to the square inch; then it was the plaster that gave way, the "Par-Lock" applica-

THAT ARCHITECT AND OWNER

whom you would like to see decide for safe construction.

Why not send them CONSTRVCTION? *Its disinterested plea for modern materials and proper methods will aid the work of your sales department.*

Give us the names and addresses of the architects and owners you would like to see better acquainted with the details of real fireproofing.

We will gladly mail them a sample copy.

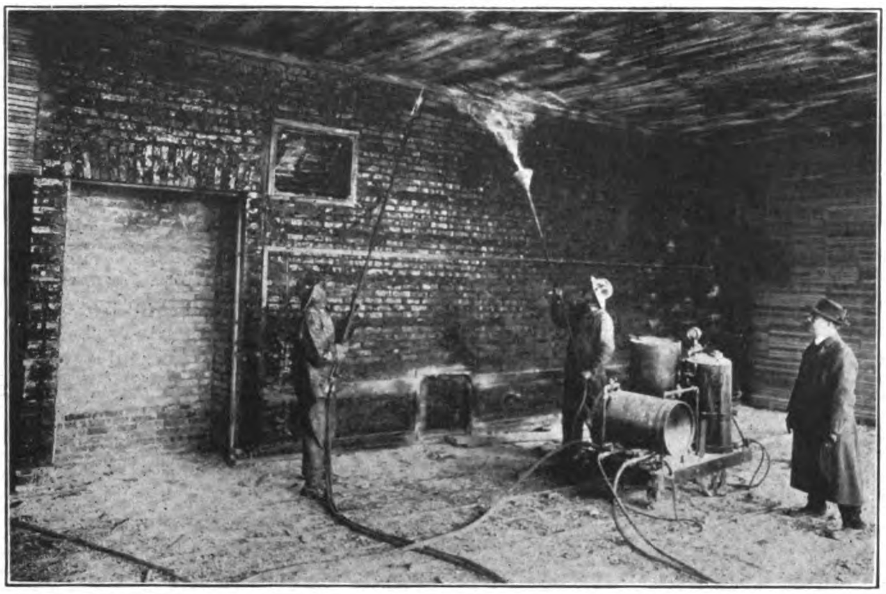
If you say so, we will also write them a brief personal letter, mentioning your name, if requested, and sketch the big facts which should interest them in modern firesafe building.

tion remaining intact.

One additional function that "Par-Lock" fulfills is in forming a damp-proof film which prevents the staining of the plaster, and also prevents any florescence passing out to the plaster from the structural floor or wall, thus preventing any injury to decorations placed upon the face of the plastered surface.

This feature of dampproofing also permits the process to be used advantageously for the treatment of the inside faces of outside masonry walls, to which the plaster is directly applied, and thus the cost and space of furring is saved. It is further claimed, which claim seems to be perfectly legitimate, that as the process is applied by responsible companies, the responsibility for results is completely localized.

Further information regarding this process can be secured from the Union Products Company, of Cleveland, Ohio, with the names and addresses of the operating companies who are licensed to apply this process.



Mechanical application of bonding material and ineats under the "Par-Lock" specification, East Milwaukee School, Wis.

* * *

At the annual meeting of the National Fire-Protection Association held in Chicago on May 9, one of the important topics for discussion was that of safeguarding school children from fire. The topic is subdivided into Planning School Buildings for Safety, Exit Drills and Fire Escapes and Care of School Buildings.

Slate Roofing

The Bangor Slate Mining Co., Bangor, Pa., is issuing an instructive booklet on slate roofing. These manufacturers own and operate their own quarries and mills and have been in business many years. Besides roofing slate they produce the material for all sorts of structural purposes. A copy of "Slate Roofing" may be had free on request. Apply direct to the company.

Pyrene Provides Another Corporation Official

The Pyrene Sales Organization, on which the Pyrene Manufacturing Company recently drafted a new presdent in the person of C. Louis Allen, has again been called upon to provide an official for a corporation.

Mr. E. L. Kent, who for the last several years has been Railroad Sales Manager for the United States, has been elected vice-president of the Metal Hose & Tubing Company, and has resigned his position with the Pyrene organization.

Mr. Kent is a young man, but his work with the Pyrene Manufacturing Company has attracted wide attention and led to his election by the directors of the Metal Hose & Tubing Company.

The election of Mr. Allen as president of the Pyrene Manufacturing Company—a million-dollar corporation—after he had been connected with it as a salesman and sales manager for less than two years, caused widespread comment, particularly as Mr. Allen was only thirty-two years old. Now, the election of Mr. Kent is another proof of the value of the training a salesman gets with this organization, which equips him for greater responsibilities.

Mr. Kent's position as Railroad Sales Manager of the Pyrene Company will be taken by Mr. William H. Yetman, who has been the Pyrene Western railroad representative.

New Smith Mixer Folder

The T. L. Smith Company, of Milwaukee, Wis., which recently built the two largest concrete mixers in the world, has just brought out a new folder illustrating all possible combinations of the Smith Mixerette, the smallest of the Smith line. This machine has a capacity of 3 cubic feet of mixed concrete per batch, or about 5 cubic yards of mixed concrete per hour. The illustrations are especially good and the layout of the entire folder shows extended care. We have no hesitancy in suggesting that every one interested in mixers should write for a free copy of the new Mixerette folder.

S. A. F. E. Advocates Cost Accounting

After reading the highly significant statement of Mr. Hurley regarding Federal Trade Commission findings in its investigation of 260,000 corporations, in which it was found that but "ten per cent of the manufacturers and merchants know the actual costs to manufacture their product; 40 per cent estimate what their costs are, and 50 per cent have no method but price their goods arbitrarily," it is refreshing to know that the Supply Dealers Board of the Society Advocating Fire Elimination has recently held two meetings devoted to the subject of cost accounting. Those who were present speak in the highest terms of the good accomplished and say they would not have missed the meetings for the price of a year's dues.

Mr. Earl Rose of the Cuyahoga Builders' Supply Company prepared figures which were used as a basis, and eleven other members offered cost percentages as applied to eight commodities prior to January 1, 1916. These figures were then tabulated to arrive at averages which are now regarded as representative of conditions in Cleveland of "small" and "big" dealers.

It was found that it cost the dealers 5.22 per cent to handle brick, 8.14 per cent for hollow tile and .97 per cent for sewer pipe; so that, saying a certain face brick cost the dealer twenty dollars, he would have to sell it at $21.05 in order to at least avoid loss.

Cost Accounting a Revelation

That such meetings are a big step in the direction of constructive co-operation is beyond question. Doubtless some of the members present received severe "eye openers" as they saw how cost was being estimated by competitors and departed with a strong resolve to make pretty definite alterations in their methods of keeping track of cost.

Unless a business man knows beyond all doubt exactly what it is costing him to operate his affairs, he cannot say whether or not he is making or losing money.

The building material business has been in especial need of modern cost methods as against the obsolete and antiquated systems of cost accounting which have so generally prevailed among many dealers. There are many apparently insignificant items which have been set aside as being of no consequence. Investigation is needed, and only by common sense meeting together and frank discussion of the problems of cost as it at present presents itself, may those progressive dealers hope to benefit each other.

In the face of such revelatory statements as come from the Federal Trade Commission, it is childish folly for a business man to go on blinding himself regarding the very important question of costs. In just such measure as all business men get together in their various classes, and get down to real "brass tacks" on this item, will business methods and business returns improve.

Proving It

First Mother—Mrs. Clancy, yer child is badly spoiled.

Second Mother—Gwan wid yes.

First Mother—Well, if you don't believe it, come and see what the steam roller did to it.

ADOPTS OPEN PRICE POLICY

One of the greatest stumbling blocks to progress and individual freedom is that peculiar but all-too-prevalent attitude of sub-conscious acquiescence to the dictates of the god-of-things-as-they-are. We are bound more than we realize by precedent and custom. We do things the way we do simply because it is the way we have always seen them done. Seldom do we question the reason why, and, on rare occasions, having found that reason, how seldom—O how very seldom—do we attempt to fathom out a better procedure than that which through constant repetition has ever seemed to be the acme of proper action!

Yet it requires but little reflection to see that everything worth while, every innovation, every forward step has resulted only because some brain refused to be satisfied—or governed—by tradition. America started because a small band of fearless people were not satisfied with the god-of-things-as-they-are and, not seeing a suitable way out over on the other side, they packed their baggage and broke for another home ground.

It takes a strong brand of courage to blaze the way, and it is safe to say that military courage is more than matched by that courage required of a business house when it cuts away from practices which have obtained for untold years in the industry of which it is a part, and takes its stand apart from competitors for the thing it regards as representing true efficiency.

A manufacturer of face brick who has done that which it is believed should make for the best interests of the industry and who is making a straight and honest effort to smash down the hoary wall of unnecessary and prejudice which too long have hindered the face brick business, is Fiske & Company, Incorporated, of New York and Boston. In its recent announcement adopting the open price policy in the sale of its product, this concern has set a most splendid example, requiring a great deal of faith and much courage. Surely it is to be hoped that other manufacturers of brick will speedily fall in line to back up a sales policy that cannot fail to place the brick business on a lofty plane such as it should long have occupied.

Would Limit Thickness of Brick Walls

Congressman Gallivan recently introduced in the House of Representatives a bill "to regulate the thickness of walls in buildings in the District of Columbia." Following is the bill, which has been referred to the Committee on the District of Columbia:

"That it shall be unlawful to construct or erect any building in the District of Columbia over fifteen feet in height, fifteen feet in width, and fifteen feet in length, composed of brick or a substitute for brick, with walls less than thirteen inches in thickness, with the exception of interior walls other than party walls.

"That all laws and regulations now in force in the District of Columbia contrary to this Act shall be void.

"That the Building Inspector of the District of Columbia shall not issue any permit for the erection of any building the plans and specifications of which do not comply with this Act.

"That any violation of this Act shall be punishable by a fine of not less than $500 nor more than $2,000, or not less than thirty days in jail, nor more than two years.

"That walls constructed of brick or a substitute for brick less than thirteen inches in thickness shall be condemned and demolished under the direction of the building inspector's office, and the cost for same shall be levied against the owner.

"That this Act shall take effect immediately upon its passage, but shall not apply to any building then in course of construction."

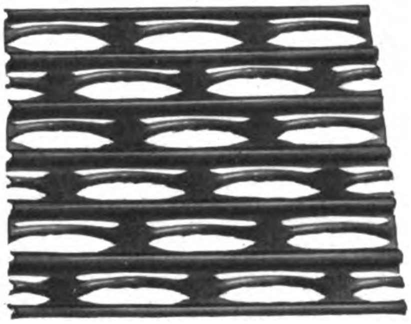
New Brick Association

With the object of bettering manufacturing and market conditions, brick and other clay products manufacturers in the Raritan River section of New Jersey have recently organized the Monmouth Manufacturing Association.

The president of the newly formed organization is J. A. Fitzinger of the National Fire Proofing Company, Lorillard. G. J. Craigen of the Craigen Brick Company, Cliffwood, is first vice-president; B. K. Eskesen of the Matawan Tile Company, second vice-president; C. E. Watrous of the Munning-Loeb Company, Matawan, secretary, and W. A. Gill of the Renwreck Company, Keyport, is treasurer.

"BOSTWICK"

made the first metal lath a quarter
of a century ago.



"BOSTWICK TRUSS-LOOP"

has been developed from practical
experience—actual service.

IT INSURES YOU
FIRE RESISTANCE
STRENGTH and RIGIDITY

A Perfect Plaster Key
Low Finished Cost

THE BOSTWICK STEEL LATH CO.
NILES, OHIO

Your Home is Known by the Company it Keeps

The selection of a site is all important.

When you buy, rent or sell real estate of any kind our services will help.

Our three offices offer unusual facilities to every client.

GENERAL REAL ESTATE

THE ONELLY CO.

Main Office:

Ground Floor, Williamson Building
CLEVELAND, OHIO

BRANCHES:

East Cleveland, 13592 Euclid Avenue
Lakewood, Corner Belle & Detroit Ave.

One-half of a Brick is Service

You not only need brick for your Building Operation but you must have them when you want them.
We have anticipated the demands of a growing city.
Every year we increase our output and our service equipment.
We are now prepared for 1916 BUSINESS.

The Farr Brick Co.

Leader-News Bldg., Cleveland

REYNOLDS

FIRE SAFE

APPROVED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS
TRADE MARK
H.M.R.
ESTABLISHED 1868

SHINGLES

TESTED by the Underwriters laboratories under their standard tests, Reynolds Shingles have proven themselves worthy of classification as fire preventatives.

Reynolds Shingles have a top surfacing of granulated slate, granite, etc., and they positively will not ignite from flying sparks or brands. Where fire originates inside the building they have a marked blanketing influence.

We call them "Safety First" because they protect from rain or storms, from heat or cold and from the common agencies which spread fire.

Reynolds Shingles are the standard asphalt Shingles and you will make no mistake in insisting on Reynolds Shingles.

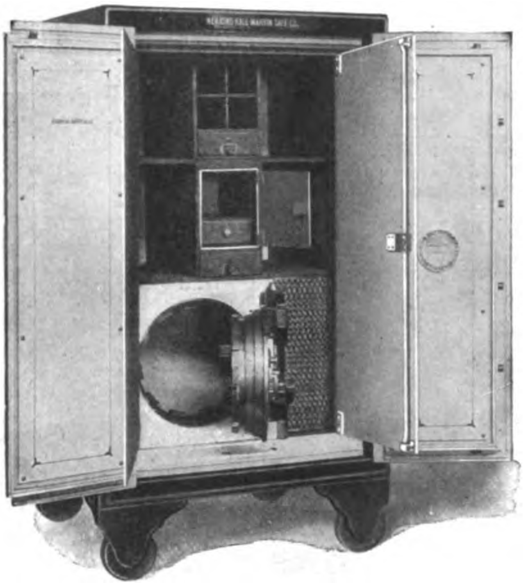
ROOFING MATERIAL
CLASS E

If your dealer cannot supply you write the factory.

H. M. Reynolds Asphalt Shingle Co.
"Originators of the Asphalt Shingle"
Grand Rapids MICHIGAN

HERRING-HALL-MARVIN SAFE COMPANY

Designers and Manufacturers of



Fireproof and Burglarproof

SAFES, VAULTS & SAFE DEPOSIT BOXES

For Offices, Residences, Banks and Bankers

We offer the benefit of our experience of over seventy-five years in the manufacture of fire and theft-resisting safes and vaults and specially constructed Burglarproof equipments for Banks and Safe Deposit Companies.

Plans and Specifications furnished without cost

Executive Offices
400 B'way, New York

Factories
Hamilton, Ohio

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Boston, Mass. ***San Francisco, Cal.*** ***Chicago, Ill.***
Birmingham, Ala. ***New York, N. Y.***

STUCCO HOUSES
Cost Less Than Frame

Would you like to know how to build a **Stucco** house at less cost than frame?

Would you like to know how to save **33⅓** per cent in cost of the wall construction and get a fire-safe, more attractive, more durable house?

Then write to us today for full information, booklets and cost data on Stucco houses.

Let us prove our claim to you.

The Cleveland Builders Supply Co.
Cleveland, Ohio

for

Converts to Cooperation

Analyze this and the past numbers of Constrvction

Then ask yourself if you ever heard of anyone doing such real service for the fireproofing cause. It is our conception of vital boosting—this jumping right into legislative battles and fighting for ordinances favoring the use of fireproof material in building construction.

CONSTRVCTION is the only publication wholly devoted to consistent fireproofing—it is actively fighting for its constituents—it wants to be measured by the value of the good it accomplishes for your product.

Subscribe for CONSTRVCTION
Get Your Associates to Do Likewise

Help Us to Help You

Fireproofing Information Bureau

¶In establishing this complete reference service, manufacturers and others producing catalogs, house organs, price lists, etc., are requested to forward their printed matter and samples and place CONSTRVCTION on their permanent mailing lists.

¶The FIREPROOFING INFORMATION BUREAU is intended for the use of resident and visiting architects, engineers, contractors and the general business and professional firesafe building fraternity, as well as prospective building owners, to whom its use will be extended gratuitously.

¶Every effort will be made to develop and maintain this Bureau to a high point of efficiency.

¶Prompt coöperation is solicited.

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Conditions for building never will be more favorable than at the present time.

Let your dream of that Safe Home be realized this year.

We sell every material for the Fire Resistive Building.

Service the best.

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OF NEW YORK

220 East 138th Street

"What Fools these Mortals Be"

An honest business family, consisting of manufacturers, jobbers and retailers, is driving through the forest of distribution to the market place. The woods are beset with hungry wolves, and the only safe route is along the well-marked road of intelligent advertising. The driver is a safe and experienced Advertising director and the members of the party are armed with cash resources, ability and experience, with which they may fight their common enemy, the wolves. They are all anxious to obtain the profits awaiting them at the market place and they show some impatience at the time the journey requires. Finally there is a dispute as to a shorter course to be followed. The manufacturer, the jobber, the retailer and the consumer, each insists on dictating the way. Suddenly they seize the reins and the frightened horses plunge off the established road. Then the men attack each other, each striving to control. Their weapons are turned against each other and immediately their common enemies, Fraudulent Advertising, Dishonest Merchandising, and Unfair Competition come closer to the sleigh. The wolves realize that their victims are being prepared for them. Their jaws snap eagerly in anticipation of the feast. It is evident that the entire party is doomed if the family conflict continues. One by one the members will be dragged down by the wolves. Their fate is inevitable—but harken! Hear those shouts at a distance! Another party is approaching at top speed! There is yet hope, for it is the Vigilance Patrol maintained by The Associated Advertising Clubs of the World. Business will be rescued! The guns of the truth-in-advertising forces will be turned on the marauders and the family will be conducted to the safety of public confidence.

This is one of a series to Advertise Advertising—by the Associated Advertising Clubs of the World (headquarters Indianapolis). The illustration is used through the courtesy of the publishers of "Puck" The text was prepared by Merle Sidener, chairman of the National Vigilance Committee of the Associated Advertising Clubs. Write for booklet, written for buyers like yourself. Every man or woman who buys any kind of commodities will find it profitable reading.

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One of the Automatic Closing Types of

STEEL ROLLING FIRE SHUTTERS

Manufactured by

THE KINNEAR MFG. CO.

Columbus, Ohio

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COLISEUM, CLEVELAND
FEBRUARY 16th to 26th, 1916

There is necessity for prompt action on the part of those who are not already in this big American Exposition.

The exhibits will be grouped in three general classifications:

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A place for everything pertaining to building.

A show conducted by manufacturers and dealers —not for profit.

Six big national trade Conventions in Cleveland during the Show.

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CONSTRVCTION

ADVOCATING THE CONSISTENT VSE OF
FIREPROOFING MATERIALS & PROTECTIVE DEVICES

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WITH A DEPARTMENT DEVOTED TO

SAFE HOMES

MARCH, 1916

VOL. II

NO. 3

NITRO-CELLULOSE FILMS

FIRESAFE CONSTRUCTION OF SCHOOL BUILDINGS

HOLLOW STEEL TRIM AND DOORS

TESTS ON COLUMN PROTECTION AT CHICAGO

SAFE HOMES FOR $3,000

Price 20 Cents

$2.00 Per Annum

OFFICIAL JOURNAL OF SOCIETY ADVOCATING FIRE ELIMINATION

THE WORLD'S LARGEST OFFICE BUILDING

ABSOLUTELY FIREPROOF

EQUITABLE BUILDING

ERNEST R. GRAHAM, Architect NEW YORK THOMPSON-STARRETT CO., Builders

TO GIVE THE GREATEST POSSIBLE PROTECTION TO TENANTS AND TO SECURE THE LOWEST POSSIBLE INSURANCE RATE, THE OWNERS OF THIS BUILDING INSISTED THAT IT SHOULD BE ABSOLUTELY FIREPROOF AND BUILT OF THE MOST APPROVED MATERIALS. NATURALLY THIS CALLED FOR METAL DOORS AND TRIM THROUGHOUT. THE BUILDING CONTAINS 9025 DOORS, 500,000 FEET OF BASE MOULDING, AND 465,000 FEET OF PICTURE MOULDING. ALL DOORS ARE HUNG TO OUR PATENTED STEEL BUCK. THIS ENTIRE ORDER WAS MADE AND INSTALLED BY

EMPIRE ART METAL CO., John W. Rapp — President — **College Point, N.Y**

One of the Automatic Closing Types of
STEEL ROLLING FIRE SHUTTERS
Manufactured by
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Columbus, Ohio

BECAUSE its propaganda for firesafe building, equipment and furnishing is so logical and because CONSTRVCTION is keeping so consistently to the purpose of that propaganda, the present number marks an advertising growth which proves that men realize the value of cooperative effort.

With nine months of preparatory work and six consecutive monthly issues, CONSTRVCTION now shows the moral and financial support of such national concerns as appear in this number.

These manufacturers are among the leaders in almost every industry related to firesafe building construction. Others now have the magazine under consideration. There is every indication they will shortly appear in the display pages.

These firms realize that the editorial, news and advertising policy back of CONSTRVCTION is sound, that it is logical to expect such a magazine to grow in service ability, that it is business-like to show our public that the paper has their good will, that in so indorsing CONSTRVCTION'S work for intelligent national publicity favoring firesafe building they are wisely helping the journal to help them, and in so doing everyone—architects, engineers, contractors, the building public, manufacturers, and ourselves, will be benefited.

These truths invite your consideration—and investigation.

This department offers, without obligation to you, complete information regarding this publication.

Manager of Publicity.

CONSTRVCTION

ADVOCATING THE CONSISTENT VSE OF
FIREPROOFING MATERIALS & PROTECTIVE DEVICES

■ ■ ■ ■ ■

WITH A DEPARTMENT DEVOTED TO

SAFE HOMES

MAY, 1916

VOL. II

NO. 5

Exposure Hazards

Protecting Building Exteriors
Against
Communicated Fires

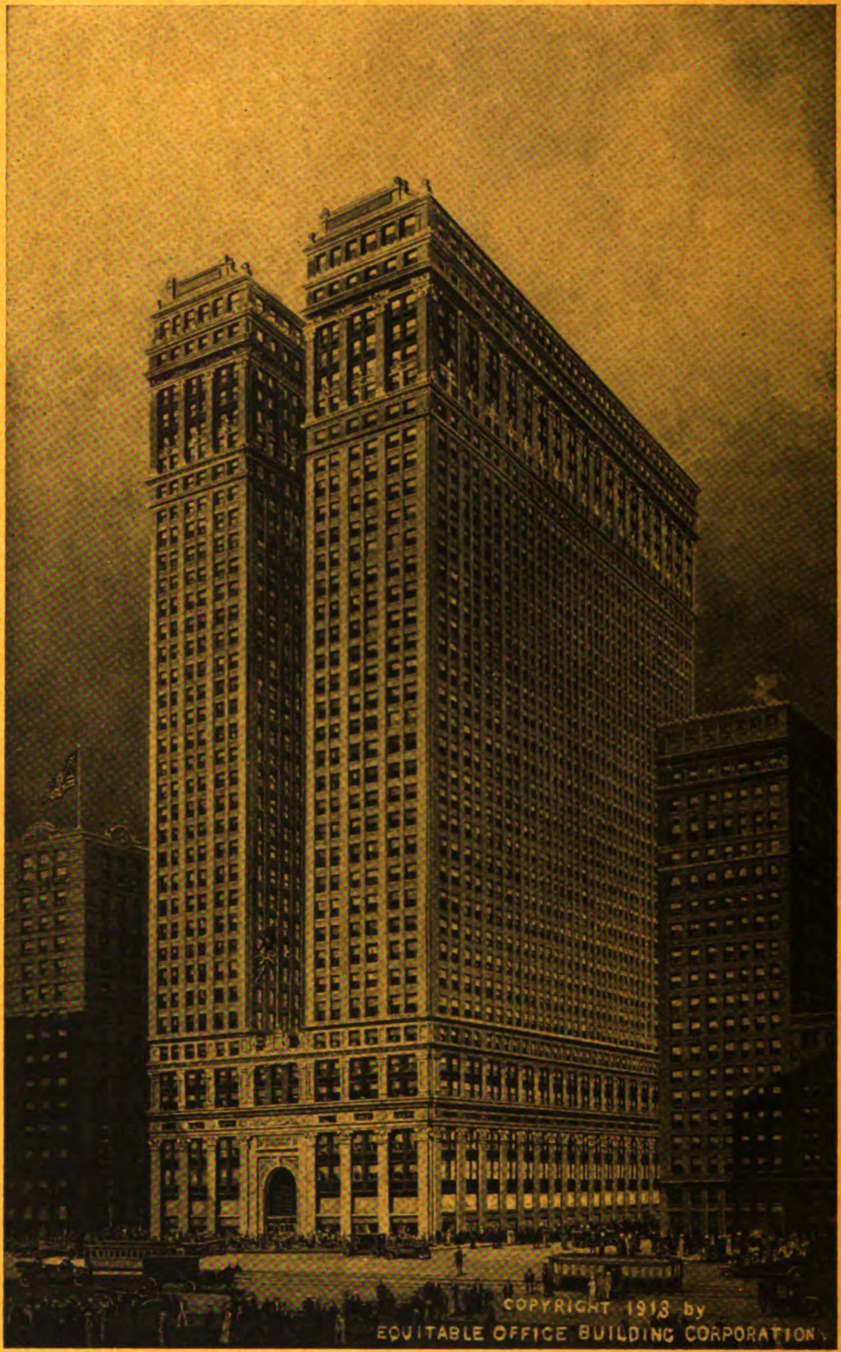
Price 20 Cents

$2.00 Per Annum

OFFICIAL JOURNAL OF SOCIETY ADVOCATING FIRE ELIMINATION

THE WORLD'S LARGEST OFFICE BUILDING

ABSOLUTELY FIREPROOF



EQUITABLE BUILDING

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EMPIRE ART METAL CO., — John W. Rapp, President — **College Point, N.Y**

FORD SERVICE BUILDING—PHILADELPHIA, PA.

TYPICAL INSTALLATION
OF
Kinnear Steel Rolling Doors
ON ELEVATOR SHAFT OPENINGS

KINNEAR PRODUCTS

have been refined to meet the most exacting architectural requirements and are available for any type of construction or for practically any kind of opening.

If you are seeking an effective fire stop which combines economy of space, ease of operation and low cost of maintenance, write us for detailed information.

THE KINNEAR MFG. CO.
Columbus, Ohio

Branch Offices:
Boston Philadelphia Cleveland Detroit Chicago San Francisco

TURN THE LAUGH ON THE FIRE DEMON !!!

IF THERE'S ANYTHING I LOVE, IT'S A FIREPROOF BUILDING FILLED WITH WOODEN FURNITURE
THE FIRE FIEND

—*From New York Press.*

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Art Metal

Steel Office Furniture and Files Because

STEEL won't burn
STEEL won't warp
STEEL won't stick or swell
STEEL won't waste valuable space
STEEL won't cost any more than wood in the long run.

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SEND FOR THIS FREE BOOKLET

" Are Fireproof Buildings Fireproof?"
A copy will be sent you if you mention "Construction."

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WITH A DEPARTMENT DEVOTED TO

SAFE HOMES

JUN 5 1916
COLUMBIA UNIVERSITY AVERY

JUNE, 1916

VOL. II NO. 6

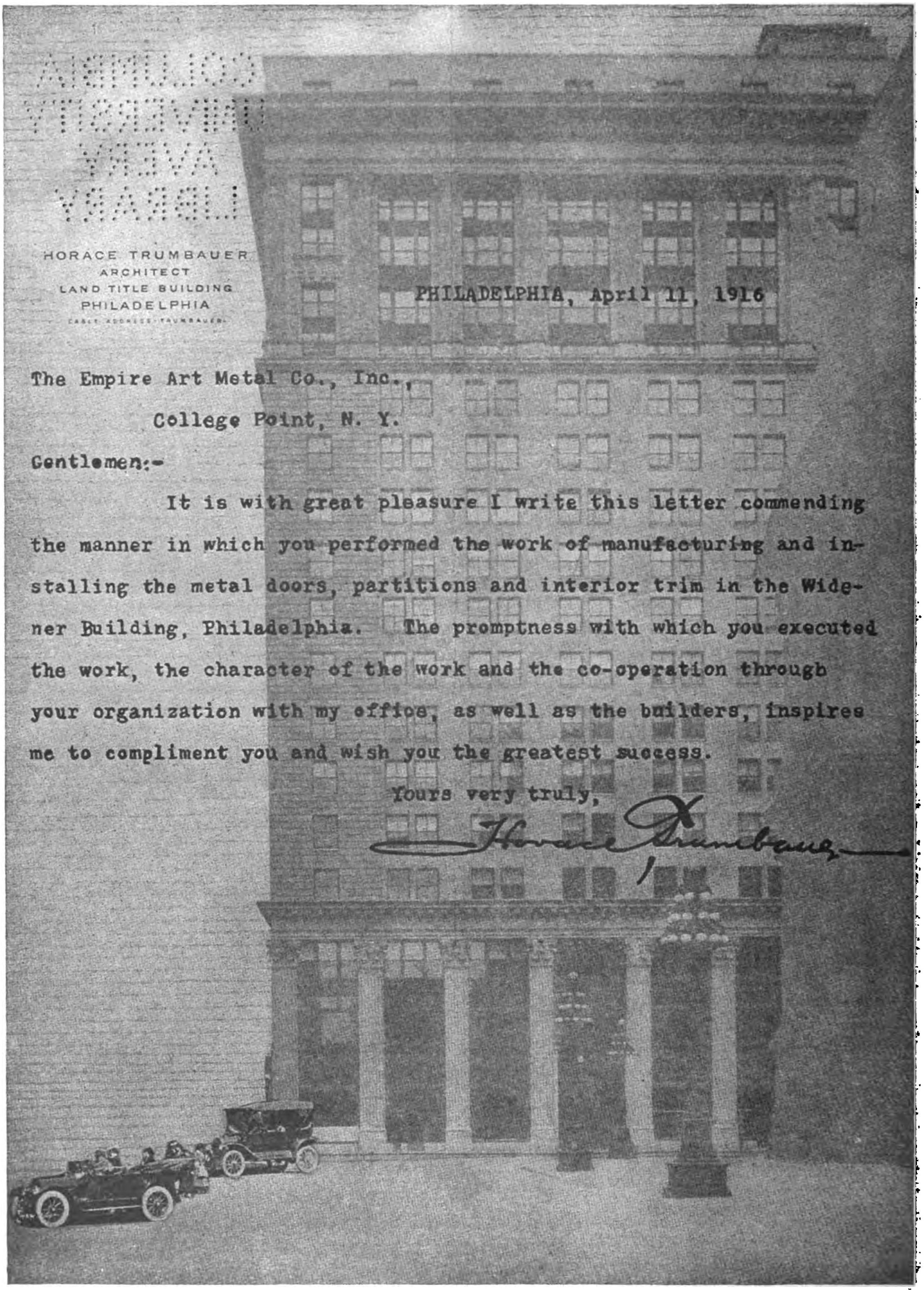
Common Sense

Home Building

Protecting the Small House Against Fire

Price 20 Cents *$2.00 Per Annum*

OFFICIAL JOURNAL OF SOCIETY ADVOCATING FIRE ELIMINATION



HORACE TRUMBAUER
ARCHITECT
LAND TITLE BUILDING
PHILADELPHIA
CABLE ADDRESS TRUMBAUER

PHILADELPHIA, April 11, 1916

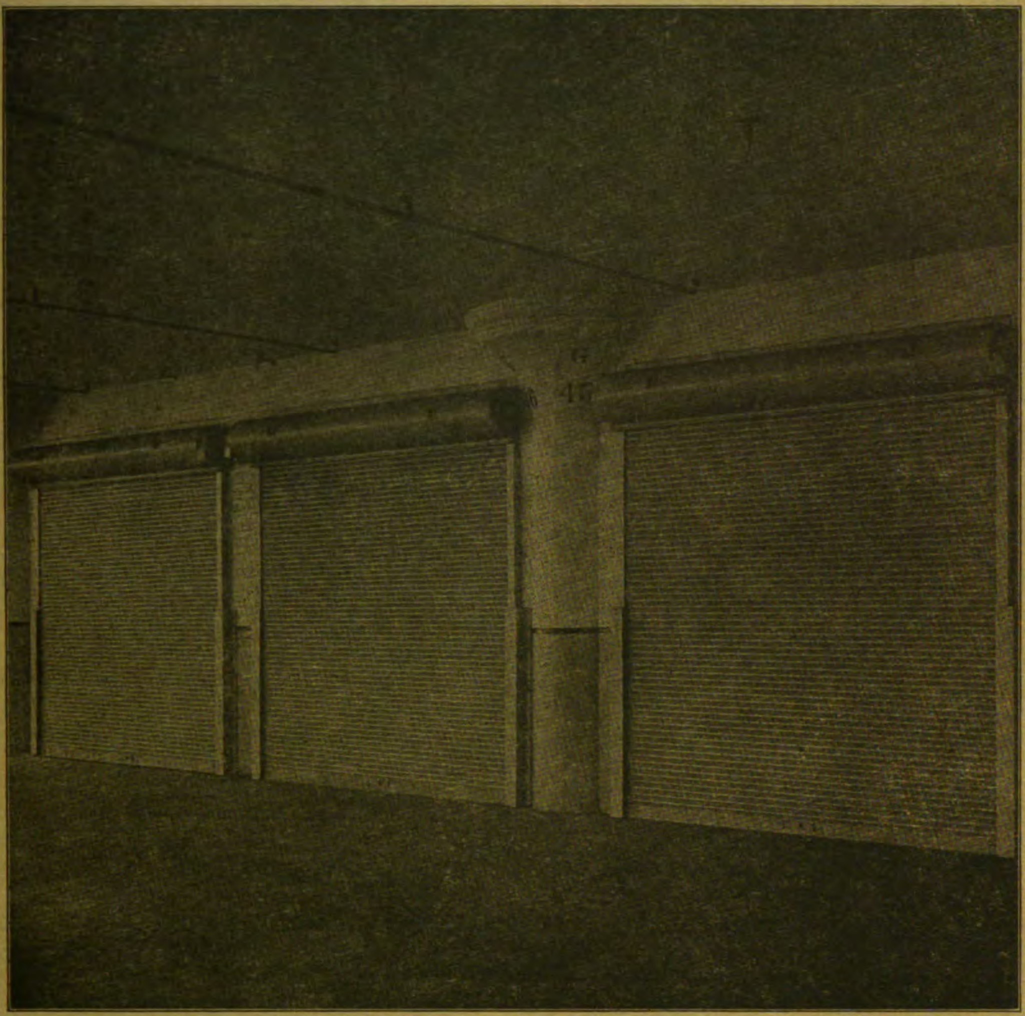
The Empire Art Metal Co., Inc.,
College Point, N. Y.

Gentlemen:-

It is with great pleasure I write this letter commending the manner in which you performed the work of manufacturing and installing the metal doors, partitions and interior trim in the Widener Building, Philadelphia. The promptness with which you executed the work, the character of the work and the co-operation through your organization with my office, as well as the builders, inspires me to compliment you and wish you the greatest success.

Yours very truly,

Horace Trumbauer



FORD SERVICE BUILDING—PHILADELPHIA, PA.

TYPICAL INSTALLATION OF Kinnear Steel Rolling Doors ON ELEVATOR SHAFT OPENINGS

KINNEAR PRODUCTS

have been refined to meet the most exacting architectural requirements and are available for any type of construction or for practically any kind of opening.

If you are seeking an effective fire stop which combines economy of space, ease of operation and low cost of maintenance, write us for detailed information.

THE KINNEAR MFG. CO.

Columbus, Ohio

Branch Offices:
Boston Philadelphia Cleveland Detroit Chicago San Francisco

Art Metal
Jamestown, New York
U·S·A

Five Disinterested Opinions!

Safety Engineering

① "We must conclude, therefore, that in order to properly safeguard life and conserve our building construction it is imperative to eliminate from so-called fireproof buildings all inflammable trim and furniture and exercise common sense in their construction."

Chief Kenlon

② "The supposed fireproof buildings in the financial section of the city are so full of unnecessary furniture, they are worse than a furniture warehouse when they begin to burn, and are more than ordinarily perilous to firemen."

Mr. Walter Pierce

③ President of the importing firm of S. L. Pierce Co., Boston:

"It seems to me it would be dangerous to restore the Wooden Custom House furniture to the new building. Desks, chairs and cabinets of wood, together with the masses of valuable papers which will be stored there, would make food for a veritable furnace of fire, if the flames were to ignite some section of the building."

"All steel furniture would obviate this danger." —From Boston Globe.

Scientific American

④ "It is necessary, not merely to construct the building itself of incombustible material, but to see to it that everything of a combustible nature in the way of fittings and furnishings be most rigidly excluded."

Commissioner Adamson

⑤ "There is one large insurance office which I have in mind. It occupies an entire floor unseparated by partitions. There are at least two hundred and fifty wooden desks in this monster room, which is crowded with girls and young men. Once a fire gained headway there it would be a seething furnace and the loss of life would be considerable.

STEEL
Vs.
WOOD

STEEL won't burn

STEEL won't warp

STEEL won't stick or swell

STEEL won't waste valuable space

STEEL equipment reduces your insurance rate

Art Metal
Construction
Co., Inc.,
Jamestown, N. Y. (76-G):

Please send me a copy of your free booklet, "Where Fire Has No Terrors."

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Address............................

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